Columnist Paul A. Strassmann is back. PAGE 35 Why IT is becoming strategically irrelevant. PAGE 44

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TARNISHED IMAGE

DAVID HOLLENBACH

Budget overruns, project failures and lingering resentment over the millions of dollars spent on Y2k are to blame for IT's latest credibility crisis. Some 45% of CIOs acknowledge the problem, which they attribute mostly to IT being too slow and too expensive. To turn things around, IT managers are focusing more on short-term ROI and getting business units more involved in IT planning and decision-making. Page 37

PeopleSoft Plans Technology Blitz To Simplify Apps

Vows to cut installation, integration and upgrade costs, but reveals few specifics

BY MARC L. SONOINI
LAS VEGAS

PeopleSoft Inc. last week outlined an initiative to reduce the cost of installing its business applications, simplify the process of integrating them with other systems and streamline user upgrades of the software.

At PeopleSoft's 2003 Leadership Summit conference here, the company said the plan also includes the development of technologies designed to further automate its software support operations and improve application quality and usability.

Craig Conway, PeopleSoft's president and CEO, said in his keynote speech that the Pleasanton, Calif.-based software vendor plans to spend "hundreds of millions of dollars" on the effort over the next few years. Application projects and other IT operations remain too "people-intensive," he added.

PeopleSoft executives didn't disclose much in the way of specific product plans. But their vow to make application maintenance and upgrades less of a chore struck a chord with Vicki Silvera, director of information systems at Vail Resorts Management Co. in Vail, Colo.

PeopleSoft, page 55

EDS Sinks Under Weight of N/MCI Anchor

Problems with huge Navy intranet project take $334 million toll

BY DAN VERTON

Electronic Data Systems Corp. last week reported a quarterly net loss of $126 million, blaming "problem contracts" and a whopping $334 million pretax loss stemming from difficulties with the multibillion-dollar Navy/Marine Corps Intranet program.

Robert Swan, chief financial officer at EDS, said the two primary causes of the loss associated with the N/MCI contract were lower profit margins on N/MCI seats and deployment delays.

The average N/MCI seat price dropped by 4%, a significant hit resulting from the Navy's decision to place more orders for cheaper N/MCI seats and fewer for higher-priced seats that are configured differently, said Jeffrey Baum, an EDS spokesman. The order therefore fell short of EDS estimates on the number of high-margin seats that the Navy would require.

That shortfall was offset somewhat by a recent improvement in the number of seats deployed and concessions from EDS subcontrac-

N/MCI, page 55

N/MCI: What Went Wrong?

Quarter ended Dec. 31, 2002
- $70M contribution to bottom line

But ...
- Average seat price dropped 4%
- There was a 29% reduction in the number of seats that transitioned to N/MCI

Quarter ended March 31, 2003
- $334M pretax loss

WLAN Security Still Vexes IT

Shops need policies to ban rogue access points, IT pros say

BY BOB BREWIN
PALM DESERT, CALIF.

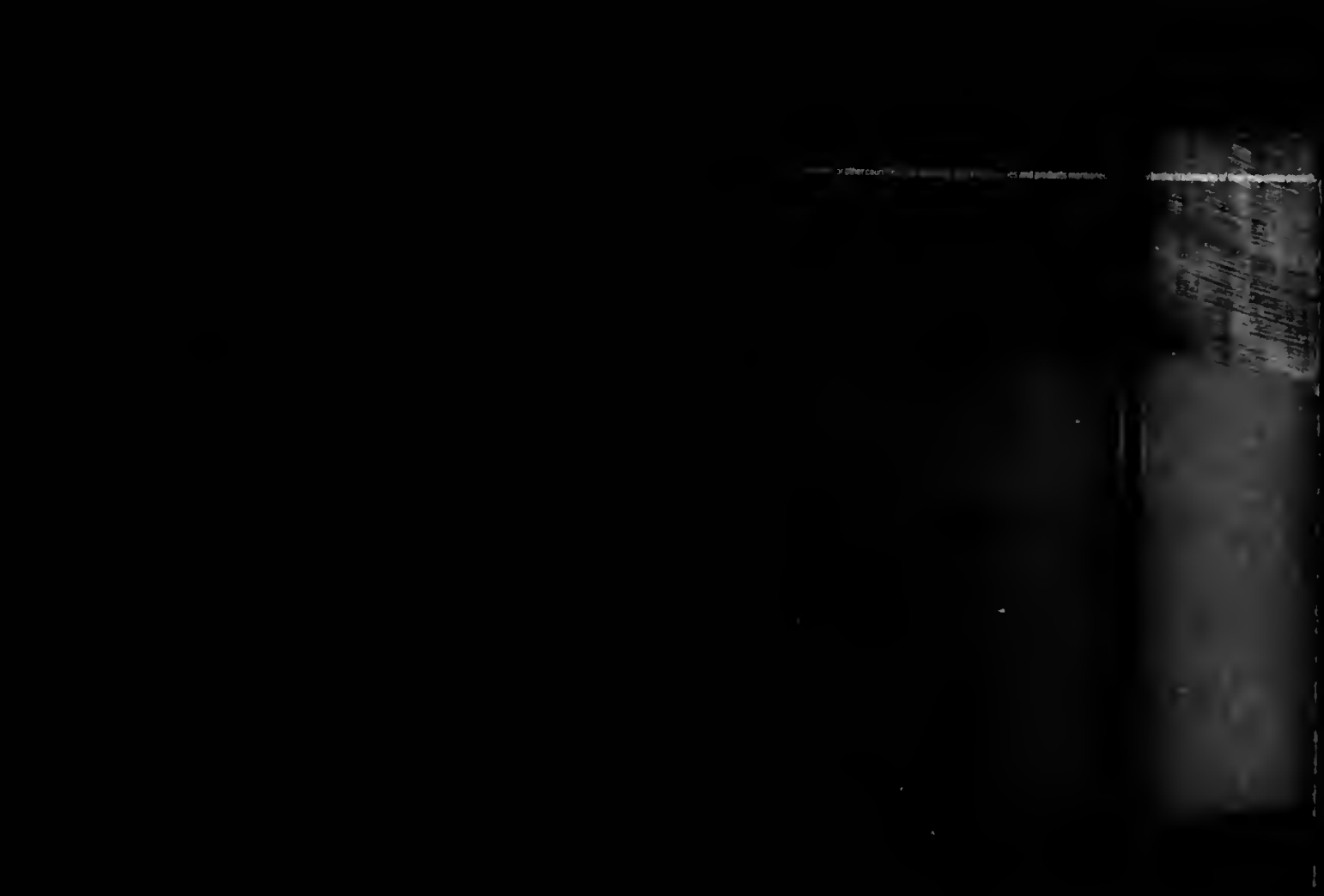
Corporate IT managers continue to grapple with wireless LAN security issues, including the battle against the installation of unauthorized WLAN access points by employees who are unmindful of the risks such links can pose.

That was the theme repeated last week by many attendees at *Computerworld*'s inaugural Mobile & Wireless World conference here. About 200 high-level IT executives attended the event.

Tom Dillon, manager of mobile and wireless technology at Hilton Hotels Corp. in Beverly Hills, Calif., said the manager of a Hilton hotel he recently visited assured him that

WLAN Security, page 14


With 10 servers.



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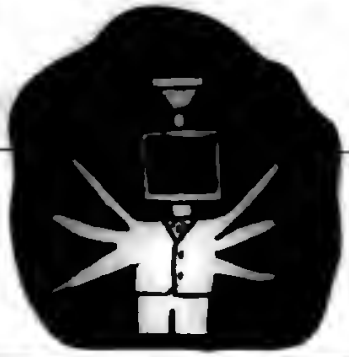

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Squandered Opportunity

In the Management section: Companies invested heavily in IT asset management prior to the year 2000, but they have largely failed to make long-term improvements. Here's how to pick up the pieces. **Page 42**

Automated to the Core

In the Technology section: Data center automation software can help companies cut administrative costs and improve efficiencies at the heart of the IT infrastructure. But beware of immature software. **Page 25**

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Web Site Privacy Seals: Are They Worth It?

E-BUSINESS: You've seen those Truste and BBB privacy logos on Web sites. Should you get one, too? Columnist Jay Cline offers some advice. **QuickLink 38290**

C# Type Conversions

DEVELOPMENT: Get an overview of possible type conversions in the C# language. **QuickLink 38291**

Hands On: Using Imaging To Deploy Apple Software

MAC: In his first article for *Computerworld.com*, IT professional and technology writer Ryan Faas explains how to deploy copies of s master disk software image across a large number of Apple computers. **QuickLink a3150**

Epicenter of the Real-Time Enterprise

SECURITY: Federated identities hold the key to helping companies control growing amounts of information from employees, customers and partners, says Bill Malik, CTO at Waveset Technologies. **QuickLink 37595**

Designing the Storage Network Backbone

STORAGE: The storage network has come into its own, and more business managers are viewing the technology as a long-term strategic resource, according to Eric Blonda at Sandial Systems. **QuickLink 37642**

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Differentiating plan from those of rivals key for company

BY PATRICK THIBODEAU
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With its Darwin Reference Architecture, HP

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Must companies that adopt your adaptive enterprise strategy also use HP services? Are you locked into outsourcing to HP services? No. Have we created intellectual property and methodologies that we believe are highly pragmatic in terms of helping you move toward an adaptive enterprise? Yes.

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Plan mock terrorist attacks to evaluate medical community's preparedness

BY DAN VERTON
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HOW IT WORKS

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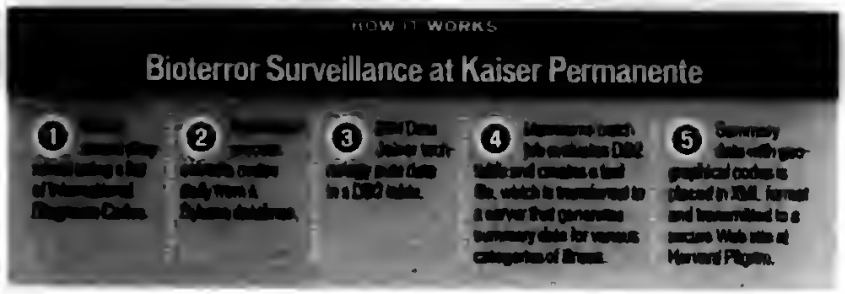

AT&T Speeds Up Global Rollout of IP VPN Services

Carrier establishes consulting team, plans network links in 50-plus countries

BY MATT HAMBLEN

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"Everybody and his mother has an IP VPN service," Bhagavath said. As a result, AT&T is trying to show that it has the broadest global reach and the most advanced VPN functionality, be explained. VPN offerings that make use of MPLS could provide users with greater scalability and better traffic management capabilities than other approaches do, Bhagavath said.

SOURCE: FORRESTER RESEARCH INC., CAMBRIDGE, MASS.

Coverage Considerations

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Jenner said AT&T will make it a priority to provide improved VPN provisioning services. The company and its rivals have faced criticism from large users regarding their provisioning capabilities. "In general, customers voice dissatisfaction even with AT&T . . . on provisioning," Jenner said.

Telecommunications carriers like AT&T need to become more knowledgeable about business applications and other technologies, Bhagavath said. "They are very telecom-savvy, but they have to train their people more on CRM, IP and Oracle databases, for example," be said.

Another thing IP VPN customers should monitor is how well carriers work with providers of last-mile communications services, because that's where the majority of network service outages occur, Bhagavath added.

AT DEADLINE

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Bioterror Surveillance at Kaiser Permanente

1. Clinics record diagnoses using a list of International Diagnosis Codes.
2. Automated process extracts codes daily from a Sybase database.
3. IBM Data Joiner technology puts data in a DB2 table.
4. Mainframe batch job evaluates DB2 table and creates a text file, which is transferred to a server that generates summary data for various categories of illness.
5. Summary data with geographical codes is placed in XML format and transmitted to a secure Web site at Harvard Pilgrim.

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What to Ask Yourself

Before choosing a VPN service, companies should answer these questions:

- Will the VPN include overseas sites?
- How much network bandwidth do you need?
- Would you be better off with a meshed architecture or a hub-and-spoke architecture?

SOURCE: FORRESTER RESEARCH INC., CAMBRIDGE, MASS.

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HIT Rail is jointly owned by 15 railway companies and manages IT projects for them. The IP VPN replaced a private network based on the X.25 protocol and is expected to produce annual savings of 30%, Lopez said. He wouldn't disclose the cost of AT&T's service.

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Telecommunications carriers like AT&T need to become more knowledgeable about business applications and other technologies, Bhagavath said. "They are very telecom-savvy, but they have to train their people more on CRM, IP and Oracle databases, for example," he said.

Another thing IP VPN customers should monitor is how well carriers work with providers of last-mile communications services, because that's where the majority of network service outages occur, Bhagavath added.

BRIEFS

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MARK HALL • ON THE MARK

ASP Turns Financial Corner and Proves . . .

. . . the business model, brags John Ottman, executive vice president of worldwide markets at Corio Inc. **Maybe, maybe not.** Ottman says the San Carlos, Calif.-based application service provider (ASP) had 66% revenue growth in the recent quarter over the same period last year and was **profitable – although it used the popular dot-com EBITDA method** of adding revenue dollars and cents without subtracting all of the company's real-world expenses. Still, it's a good start. It's especially good when you consider that although Corio has only 100 customers, the same as it did about three years ago, these days precious few are dot-bombers. Most of the new customers are outfits we've heard of, like American Express, Pfizer and the U.S. Coast Guard. The ASP's users also include Carlson Companies, one of the largest private companies in the U.S., which counts Radisson Hotels and TGI Friday's restaurants among its holdings. But when CIO Stephen Brown explains why Corio is good for his company, it doesn't, as Ottman would have it, "prove the business model." Rather, it proves that Corio is willing to flex its business model to get and keep customers. According to Brown, **Carlson doesn't use Corio's data center to host its applications** — which the classic ASP business model would require. Instead, it exploits Corio's expertise, leveraging the ASP's technology until it can train its own IT staff on how to run the software. Carlson then co-locates the servers in its own data center in its Minneapolis headquarters. Furthermore, even Ottman acknowledges that the traditional ASP model of demanding that users stick to cookie-cutter versions of an application is out the window. For example, Brown wouldn't have accepted his PeopleSoft application from Corio without substantial rework for Carlson's needs. "We wanted to share in hosting and customization so we would have the skill sets from a process management point of view," he says. Where the classic ASP model does work well, Brown believes, are cases in which his company needs to "get resources by the drink" from Corio, such as an extra server to handle bigger loads. • Next month Corio will be serving up another drink to its customers: **a new single-sign-on service with an identity management system.** Users who wander from their computers for too long will be logged off all their open apps. But the single sign-on will dull that pain. *Prosit.* • Monitoring application licenses can be as tough as keeping tabs on users' access to them. LANDesk Software Inc. in South Jordan, Utah, has for years been helping IT shops comply with software licenses, as well as manage the deployment of software across the network, with its LANDesk Management Suite. Following today's announcement (see below), Version 7 will hit the streets May 15 with **support for Mac OS X clients and servers.** With its profile-migration capabilities, application settings for the latest versions of Microsoft Office, Outlook and Internet Explorer will be maintained in Version 7. Lotus Notes profile migration will come in July. • Now that you're in license compliance for all your software, it's time to assure that you're **in policy compliance with regulations such as HIPAA.** One of the first out of the gate for that will be SecurityProfiling Inc. in Lafayette, Ind. CTO Brett Oliphant says you can expect the company's Policy Compliance product sometime this summer. SecurityProfiling plans to ship Version 2 of its Intelligent IDS next month. Oliphant claims that intrusion-detection systems (IDS) often identify up to **90% false positives, making these security packages essentially useless,** since systems administrators cease taking the tools seriously. The new release, which will feature an improved user interface management console, will sort through every suspect packet using Snort, an open-source IDS, and compare those packets against your application portfolio. At least then you can eliminate all those potential breaches of no consequence to your network and maybe **take your IDS seriously for once.** ▶

Next month, in San Leandro, Calif., will announce its PI Server 3.4 real-time database, which collects information on everything from process control devices in manufacturing to routers and servers on your network. The new version will be able to gulp down data on more than 1.7 million elements you may care to monitor – up from 200,000 elements in the current release

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BY MATT HAMBLEN

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PROGRESS REPORT

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From his desk at TrendLabs Los Angeles, **Joseph Miller, Ph D** joins a team of antivirus experts working worldwide to uncover data security answers enterprise-wide

Event-Driven Architecture Poised for Wide Adoption

Complex event processing the 'next big thing' after Web services, says Gartner

BY CAROL SLIWA
LOS ANGELES

JUST AS MANY IT shops are starting to get their arms around the service-oriented architecture (SOA) approach now that Web services standards are emerging, there's already a "next big thing" on the development horizon, according to Gartner Inc.

Four years from now, "mere mortals" will begin to adopt an event-driven architecture (EDA) for the sort of complex event processing that has been attempted only by software gurus building operating systems or systems management tools, and sophisticated developers at financial institutions, predicted Roy Schulte, an analyst at Stamford, Conn.-based Gartner, which held its Web Services and Application Conference here last week.

Fortunately for IT shops, the EDA approach is complementary to SOA, which forward-thinking IT shops are starting to employ in greater numbers as they forge ahead with Web services.

Taking an SOA-based approach, developers build an application by assembling "services," or software components that define reusable business functions.

One of the main advantages of the SOA approach is that by building standards-based interfaces between components, developers can incrementally construct applications and swap out, reuse and modify components without having to concern themselves with their inner workings. Those who build Web services typically describe the interfaces using the Web Services Definition Language and send XML-based messages between components using SOAP over HTTP.

But Schulte said connecting services occurs in a linear, predictable sequence, whereas an event-driven architecture allows for multiple, less predictable, asynchronous events to happen in parallel and trigger a single action.

Simple event-driven processing has been in common use for at least 10 years with technology such as IBM's or Tibco Software Inc.'s message-oriented middleware and, in the past few years, message-driven Enterprise JavaBeans, he noted.

But Schulte predicted that complex event processing (CEP) will start to become mainstream in 2007, as application developers and systems and business analysts strive to do more business in real time. Paving the way for the trend will be faster networks, the arrival of general-purpose event management software tools and the emergence of standards for event processing beginning in 2005, he said.

Hints that CEP will become mainstream include Palo Alto, Calif.-based Tibco's acquisition of Praja Inc. and IBM's work on event-broker technology, Schulte claimed. "It's obviously the first step for IBM, and the next step will be complex event processing," he said.

David Luckham, a professor of electrical engineering at Stanford University and author of a book on CEP, *The Power of Events*, said the goal of CEP is rather simple: delivering understandable information about what's happening in IT systems. That information, in turn, can be used for a variety of purposes, such as detecting unusual activity, improving security and recognizing advantageous scenarios in CRM and supply-chain systems.

"The events in IT systems contain untapped information. CEP lets you extract it and use it in ways you want to," he said.

Luckham predicted that CEP will start creeping into Web services, middleware and application servers in 2005. By 2008, he foresees the emergence of CEP standards, languages and complex event-pattern search engines. Ubiquity of CEP will come in 2012, he forecasted.

To prepare for EDA, Schulte advised companies to look at their application requirements to see if there are places where they could do simple event processing instead of SOA to design part of an application. Leading-edge companies should also look to implement complex event processing for applications that bring a competitive advantage, he said.

Meanwhile, users who still haven't adopted SOA are trying to sort it all out. "Before you get time to deploy one thing, the next thing's already out," said Vito Iannuzzelli, a senior systems architect at New Jersey Manufacturers Insurance Co. in West Trenton, N.J. ●

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Service-Oriented Architecture

SERVICE: A software component, or collection of software components, that implements a reusable business function, such as adding a new customer or looking up a customer's account balance.

SOA: An approach for designing and building applications that tie together services, which are defined by their interfaces. The SOA approach has gained favor with companies building Web services interfaces to new and existing applications with the goal of enabling them to interoperate or be combined into new composite applications. An SOA-based application consists of components that supply services and other programs that act as clients, or "consumers," of those services. Because the components are loosely coupled, developers can swap one for another without concern about their inner workings.

SOURCE: GARTNER INC., STAMFORD, CONN.

IT Managers Still Working on SOA

Gartner Inc. may see event-driven architecture as the "next big thing," but plenty of IT managers are still struggling to lay down the foundation for the current one – service-oriented architecture (SOA).

Gartner analyst Daryl Plummer estimates that no more than 30% of IT shops are doing SOA-based development by design, and among that group, less than half are doing it consistently well. But he predicted that 85% will be building applications using SOA concepts five years from now.

"It's too early for us," said Glyn Crocker, e-business applications manager at Shell Oil Products US in Houston. But he said he does see opportunity "to bring quick business value without having to rewrite legacy applications."

Robert McCartie, a group manager in the e-business group at Royal Bank of Canada in Toronto, said his company is in the "education phase," still figuring out what it might do with Web services. "But the concept of being able to loosely couple legacy applications is quite interesting," he said, even though Web services security is still immature and loose coupling and the "verbosity of XML" cause performance hits.

The SOA concept isn't new, but SOA has become a buzzword now that Web services are hitting the mainstream. Services are exposed to one another through standards-based interfaces, and SOAP is used to send XML-based messages between them. Because components are loosely coupled, developers can easily swap them out and, in theory, gain the benefit of code reuse.

But several IT managers said they won't be holding out high hopes for code reuse. "It's a major culture change because people have to be willing to share and use someone else's code," said David Wei, application development manager at SDG&E, a unit of San Diego-based Sempra Energy.

"It's an ego thing," said Xavier Soosai, a senior manager and IT architect at Farmers Insurance Group of Companies in Los Angeles. He said he would expect no more than 60% reuse – "100% reuse is not realistic." Soosai said Farmers will use the SOA approach "just where it makes sense" and won't replace existing code with new Web services because that would be expensive.

– *Carol Sliwa*

Bank CIO uses up vacation days before end of year

Prior to implementing Nokia Message Protector, CIO Sam Cooke, 42, was robbed of 2–3 weeks per year

"I feel liberated," Sam was heard saying by fellow banking staff as he left the office for a well-earned break. Sam was recently seen in Pisa wearing a very silly hat, and rumor has it he was then off to Venice to count the pigeons at St. Mark's Square. He credits his wanderlust to Nokia. "Before, I was constantly worried about the impact that [illegible] practices would have

Features
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Automatic
Updates

have the best protection wit
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We asked Sam what had in-p
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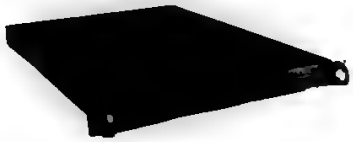
Nokia is a recognized leader in providing enterprise network security solutions. From banking and education to health care and insurance, we have the solutions that ensure your network integrity and maximize your connectivity and ROI. Nokia Message Protector integrates industry-leading virus protection technology from Trend Micro™, with spam rejection, content management and exploit rejection technology.



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CONNECTING PEOPLE

Survey Points to Continuing Friction Between Business, IT

One-third of polled business execs say they're not satisfied with their IT units

BY THOMAS HOFFMAN

ONE-THIRD of 437 business executives surveyed recently by Forrester Research Inc. said they're dissatisfied with the performance of their IT departments. But some IT managers and analysts last week said the results aren't surprising — and may actually represent an improvement in IT's standing.

The survey, which was released by Cambridge, Mass.-based Forrester last month, also found that dissatisfied business managers are more likely to fight with IT departments for control of technology initiatives. Moreover, the unhappy business executives think that their companies lag others in adopting new technologies and face higher IT project failure rates, said Forrester analyst Meredith Child.

Because this was the first time Forrester posed these questions to business leaders, it's hard to say whether the survey results signal an improvement or a decline in satisfaction with IT. But "if you ran this study in 1995, I bet the numbers might be flipped — that 66% would have been dissatisfied with their IT groups," said Steve Andriole, a senior consultant at Cutter Consortium in Arlington, Mass., and an IT management professor at Villanova University in Pennsylvania.

Since the economy's rapid growth came to a halt in late 2000, IT managers have had to work more closely with business units to cost-justify technology investments, Andriole said. CIOs "have gotten smarter about defending their IT budgets," he added.

Others were a bit more skeptical about the survey results. "This is a subject that goes a lot deeper than some of the simple correlations that [Forrester] built," said Cedric Rhoads, former director of information systems at Matsushita Avionics Systems Corp., a Bothell, Wash.-based company that develops in-flight communications and entertainment systems for the airline industry.

Two months ago, Rhoads became a product manager for a new group that Matsushita Avionics formed two months ago to develop ground-based technologies like passenger

personalization systems. Before that, he helped create an IT steering committee that includes executives from the company's five major business units plus its chief financial and technology officers.

The steering committee is developing a framework for reviewing, funding and tracking IT projects, Rhoads said. Previously, the company's IT department "had a history of working in the background," he noted.

Alignment between business units and IT is an age-old problem, said John Parkinson, chief technologist at Cap Gemini Ernst & Young's Americas division in Chicago. "Why would anybody be surprised by the [survey] results?" Parkinson asked. "This has been a problem for the 25 years I've been in the profession."

One of the challenges is that applications built to support business operations are often rigid and can be "antithetical to agile behavior," Parkinson said. "Businesses like to be able to change directions on a dime."

Parkinson said IT departments should have some of their workers "live" with business units to get a better understanding of their requirements. In addition, IT managers have to be straightforward with business leaders "on what's reasonable to expect from IT projects and what's unreasonable to expect," he said.

MORE THIS ISSUE
CIOs take steps to repair IT's tarnished image **Page 37**

Veritas Readies Tools to Support Utility Computing

BY LUCAS MEARIAN
LAS VEGAS

Veritas Software Corp. last week detailed plans to use an upcoming IT cost-allocation tool and technology from two acquisitions as the centerpieces of a product line that can be used to manage computer resources as a utility.

Mountain View, Calif.-based Veritas, which made the announcement at its Vision 2003 user conference here, became the latest IT vendor to target utility, or on-demand, computing. Company officials said Veritas will support storage virtualization, automated hardware provisioning, system-performance management and business-unit chargeback capabilities.

Several conference attendees said tight IT budgets are forcing them to try to do more with less. Management software like the tools promised by Veritas could help make that possible, they added.

Richard Guetzloff, senior director of enterprise systems at R.R. Donnelley & Sons Co. in Chicago, said he has been talking to Veritas since December about the new product suite because he wants to more effectively automate management of about 30 storage-area networks (SAN).

The SANs have a total capacity of 150TB and support about 800 application servers at R.R. Donnelley, which provides printing, content management and distribution services to publishers, retailers and other companies.

Goal: One Day of Training

Guetzloff said his goal is to install a central management console for provisioning IT resources. "I'm really looking at how to make it simpler, so that with a day of training, anyone can do this from an operating perspective," he said.

Until now, Veritas has focused on storage management tools. But earlier this year, the company said it was looking to expand into other IT management technologies, a strategy fueled partly by acquisitions that were announced late last year [QuickLink 36722].

A purchase of Westwood, Mass.-based Precise Software Solutions Inc. that's due to be completed next month will give Veritas new performance management tools. Veritas also is integrating a server provisioning application that it bought in its December acquisition of Sunnyvale, Calif.-based Jareva Technologies Inc.

The acquired products are due to be joined later this year

by Service Manager, an internally developed tool for tracking the use of IT resources.

Dong Jin Kim, a senior SAN architect at Eastman Kodak Co. in Rochester, N.Y., said he's trying to move away from using massive Excel spreadsheets to document Kodak's IT infrastructure. Kim is involved in managing more than 200 Sun Solaris servers, 160-plus Oracle databases and disk arrays from multiple vendors.

"It's becoming a nightmare to track it all," Kim said. He added that he now plans to evaluate Veritas' automated discovery and provisioning software, along with similar products from EMC Corp., IBM and Scotts Valley, Calif.-based InterSAN Inc.

Guetzloff said one thing he likes about Veritas' technology is that it appears to be more "vendor-agnostic" than rival utility computing tools being offered by server and disk array makers.

SWITCH PLANS
Veritas also said it will port some of its software to Cisco and Brocade storage switches
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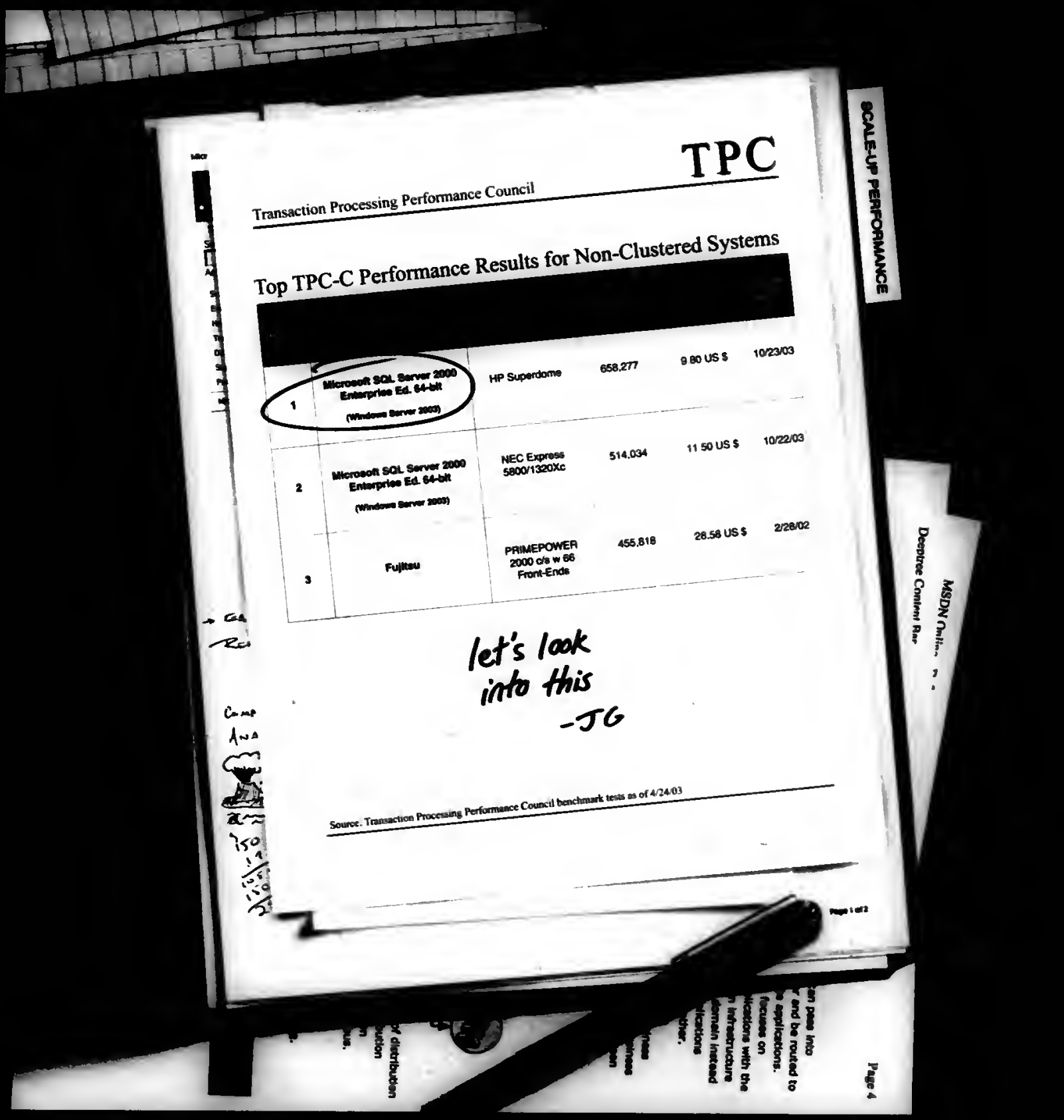

The facts tell a compelling story. Microsoft SQL Server™ 2000 is the new worldwide leader in scale-up server performance, achieving the top two rankings in the latest TPC-C benchmark tests. To learn how SQL Server 2000 can quickly increase your scalability, visit www.microsoft.com/sql/tpc. **Software for the Agile Business.**

Microsoft

Blogs Play a Role in Homeland Security

Make it easy for critical-infrastructure agencies to share info from bottom up

BY DAN VERTON

WEBLOGS, the Internet technology that allows anyone with a browser to publish a personalized online journal, are increasingly being used to support the intelligence-sharing requirements of homeland security efforts.

Providence, R.I.-based Traction Software Inc. today will announce that the Western States Information Network (WSIN) has deployed Traction's TeamPage enterprise weblog software to support law-enforcement task forces that are working on terrorism and drug investigations.

Karen Aumond, assistant director of the WSIN, said a new project called the Advanced Terrorism Information Exchange, which is being expanded to local water departments, fire departments and other critical-infrastructure organizations, will be one of the first initiatives to benefit directly from enterprise weblogs.

"What typically happens is that there is a flurry of e-mails, and everybody is copied on the e-mail," Aumond said. "And they are automatically purged after 60 days if you don't archive them. By doing this [posting e-mails to a weblog], we can forward these e-mails to a central place, and then we can access them from the road. And what's even better, we can search them."

Criminal-intelligence analysts are using TeamPage to create access-controlled weblogs, or blogs, as repositories for research data collected for further analysis. The WSIN watch center in Sacramento, Calif., uses them to share user tips, training schedules and articles that are of interest to law-enforcement task forces.

MORE INFO
Read our QuickStudy about weblogs at
QuickLink 37757
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The enterprise weblog "has all the hallmarks of a disruptive technology," said Greg Lloyd, Traction's cofounder and president. "Unlike ERP bell or groupware bell, where it may take six months just to deploy infrastructure, weblogs that use the standard Web infrastructure can be deployed in 15 minutes."

Many Benefits

Peter Brockmann, vice president of marketing at Irving, Texas-based bTrade Inc., is using a weblog as a marketing tool for the company's business-to-business software. Low cost is only one advantage that blogs have over more traditional and complex collaboration products, he said. "The other tools allow you to do more, but what's nice about a blog is it's real easy. It's highly tuned to allow for rapid publishing," he said.

Blogging is "no-brainer Web technology," Brockmann added. By deploying it, "you save yourself a lot of headaches, heartburn and pain."

Weblogs can also benefit corporate cultures, analysts said. "Knowledge management systems are often so formal and top-down-driven that the normal worker sees no benefit in using them or contributing," said James Gaskin, an IT consultant in Dallas. "Blogs, like e-mail, flatten the hierarchy and let everyone contribute without having to stare down a suit at a meeting or contradict a manager in person."

Sundar Kadayam, chief technology officer at Intelliseek Inc., a Cincinnati firm that develops Web-based intelligent-agent and knowledge-discovery technologies, said blogging applications can add to the problem of information overload if they don't incorporate personalized searching and alert mechanisms — capabilities that Intelliseek is developing. "When those types of capabilities are layered on top of blogging tools, you're going to see the mainstream adoption of weblogs in the enterprise setting," he said.

IM Security Problems Persist

BY JAIKUMAR VIJAYAN

Security problems relating to the unfettered use of consumer chat software on corporate networks are fueling adoption of tougher security measures and more commercial-grade products, users and analysts said.

Ongoing concerns about instant messaging (IM) security were heightened last week by the disclosure of six vulnerabilities in America Online Inc.'s Mirabilis ICQ IM client software. Two of them are particularly dangerous and could allow hackers to gain full administrative control of a victim's computer, according to Ejovi Nuwere, a security engineer at Core Security Technologies Inc., the Boston software company that discovered the flaws.

A spokesman for AOL's ICQ subsidiary acknowledged the flaws in the latest version of ICQ's freely downloadable chat software. But he claimed that only one of the flaws, involving a feature that lets users open Internet e-mails, is dangerous. A fix is in the works, he added.

Sensitive Data at Risk

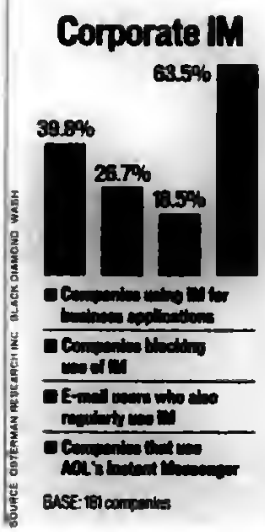
Security analysts have been warning for some time that unchecked use of such software could cause dangerous holes in firewalls, leading to sensitive corporate data being exposed on public networks and files being transferred in an unprotected fashion.

Such concerns are pushing companies to look for new ways of securing IM communications, said Michael Osterman, president of Osterman Research Inc. in Black Diamond, Wash. The firm's twice-yearly surveys have shown adoption of commercial IM products to be growing faster than consumer IM products on corporate networks.

At the same time, public IM products still dominate corporate networks. AOL's Instant Messenger, for instance, is used at 64% of the companies surveyed, Osterman said.

"The good news is that it is easy to detect the use of [consumer] services and to either shut them down or to give users an alternative that is a sanctioned enterprise product," said Dana Gardner, an analyst at The Yankee Group in Boston.

Arlington County, Va., is rolling out Microsoft's Real-Time Communications server software, which will tie into the county's Exchange 2003 and Active Directory environments. It will form the basis of a collaborative infrastructure, where users will be able to carry on secure IM and whiteboard sessions, as well as share applications and files in real time, said Vivek Kundra, the county's director of IT.

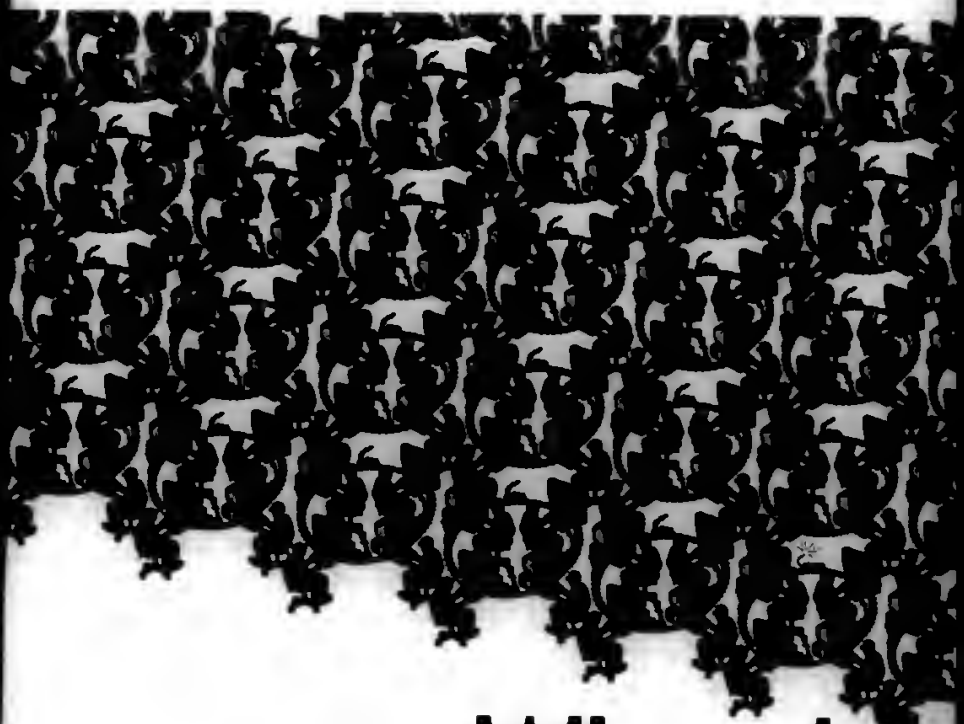


The use of consumer IM software is a serious security concern, said Scott Loach, senior information security engineer at Raymond James Financial Inc., a financial services firm in St. Petersburg, Fla.

"We have seen some vulnerabilities [in consumer IM software] that have been exploited," Loach said. The need to comply with regulatory requirements has led to a much closer scrutiny of IM use on corporate networks, he added.

The company plans to ban the use of consumer IM software on its networks, Loach said. New application-level security software from Check Point Software Technologies Ltd. in Redwood City, Calif., will make it possible to shut down consumer chat clients by simply checking a box in the software's administrative interface, he explained.

Your Enterprise Monday 10:32 A.M



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Air Force Unit Tracks Deliveries Of Parts With Wireless System

IT director says new technology could help logistics center save $15M per year

BY BOB BREWIN
PALM DESERT, CALIF.

THE AIR FORCE Materiel Command's logistics center at Hill Air Force Base in Ogden, Utah, has deployed a wireless parts-tracking system that's expected to save about $15 million annually by cutting the average length of time that parts remain in the repair pipeline from 24 hours to just two.

Mike Neri, the base's IT director, last week said at *Computerworld*'s Mobile & Wireless World conference here that Hill AFB needs to track a massive number of parts. The base moves 86,000 items in and out of 33 warehouses each month, including everything from electronic "black boxes" to landing gear assemblies used on a variety of fighter aircraft.

Although the status of parts can be monitored by a wired inventory system at the base, until the recent wireless rollout, Hill AFB had no way to track the vehicles and drivers that transport hardware from one warehouse to another. In addition, some of the warehouses and repair facilities are located miles apart from one another, according to Neri.

Now the base has deployed a wireless Automated Manifest Tracking System (AMTS) that automatically transmits pickup and delivery information to drivers equipped with cellular phones from Reston, Va.-based Nextel Communications Inc. or mobile computers made by Tokyo-based Toshiba Corp. The system works over a cellular network operated by Overland Park, Kan.-based Sprint PCS Group, Neri said.

Both the Nextel phones and the Toshiba computers have built-in Global Positioning System receivers that automatically transmit the locations of the 30 trucks used to move parts to dispatch centers, Neri said. The mobile devices are also equipped with bar code scanners, which let drivers transmit information to the base's back-end systems about the parts they pick up.

Because IT security is a prime concern for the Air Force, Neri said, the AMTS uses encryption technologies that support the Triple Digital Encryption Standard. Coverage is a concern for some users of wireless networks, but Neri said that isn't an issue at Hill because both Nextel and Sprint rely on cellular towers located on the base.

The increased visibility into the location of repair items — as well as the ability to track and dispatch drivers — has allowed Hill to dramatically reduce the time it takes to move parts through the repair process, Neri said.

It took Hill AFB two years to develop AMTS using IBM's WebSphere Everyplace Access software. Now that the wireless system is running in production mode, Neri said, he expects that it will also be installed at Air Force Materiel Command centers in Georgia and Oklahoma. ▶

IBM, Palm Combine on Mobile Starter Bundle

IBM last week launched a starter version of its WebSphere Everyplace Access software that's packaged with 25 of Palm Inc.'s Tungsten handheld devices, a move designed to let companies test-drive IBM's mobile middleware technology.

Rodney Adkins, general manager of IBM's pervasive computing division, said that the Mobile Office Entry Jumpstart Solution will provide companies with the technology needed to pilot and test mobile applications, such as sales force automation systems.

Adkins said the Jumpstart package will also let companies "start small with mobile applications and then grow over time" and evaluate returns on investment throughout the process.

Although IBM has bundled Palm hardware with the WebSphere tools as part of Jumpstart, the middleware supports a range of mobile devices, including Pocket PCs, smart phones based on operating systems from Microsoft Corp. and phones that use London-based Symbian Ltd.'s software.

The Jumpstart kit will sell for about $80,000, which includes the cost of the Palm hardware, Adkins said.

Jack Gold, an analyst at Meta Group Inc. in Stamford, Conn., said that for Palm, the Jumpstart package represents an opportunity to boost the penetration of its handheld devices into the corporate market.

Until now, most of the handhelds sold by Palm have been bought by individual users, Gold said. "Palm has just not done a very good job of putting together enterprise solutions," he added.

– Bob Brewin

Continued from page 1

WLAN Security

the property's network had only six authorized WLAN APs in operation. Dillon said he fired up network sniffer software to check the actual number of APs — and quickly detected a total of 15.

That example clearly illustrates the continued proliferation of rogue APs, he noted. Dillon said IT managers need to fight back by setting and enforcing strict policies against unauthorized WLAN devices. He also recommended that companies institute tough end-user authentication systems to ensure that only legitimate users can gain access to wireless networks set up to transmit sensitive business information.

In addition, Dillon said companies need to set rules governing the use of WLAN client devices, which can be operated on home or public-access WLAN systems that lack stringent security controls. For example, Hilton now requires that WLAN cards in laptop PCs be disabled when the systems are connected to the company's wired LANs to prevent viruses or Trojan horses from being injected into the networks.

In a similar vein, IT staffers at Sears, Roebuck and Co. have added software to the 10,000 WLAN-equipped notebook PCs distributed to the retailer's field service technicians that blocks them from using public-access hot spots, said Dave Sankey, director of process and technology development at Sears. He added that Sears plans to install private WLAN hot spots at stores and other company facilities so technicians can access training materials.

Growing Concern

The need to better secure WLANs is expected to remain a paramount concern for IT managers as the use of high-speed, over-the-air networks continues to expand. Gartner Inc. in Stamford, Conn., estimates that shipments of WLAN chip sets used in both APs and client devices totaled 18 million units last year and predicts that the figure will hit 50 million by 2006.

Joe Przeporia, an IT manager at agricultural products conglomerate Cargill Inc. in Wayzata, Minn., said the company's numerous business units use such a wide variety of WLAN and fixed wireless technologies "that we are not [yet] equipped to deal with it at a corporate level." But, he added, Cargill has started to develop high-level policies to address WLAN security issues, including rogue APs.

Hewlett-Packard Co. has scrambled to come up with policies governing the use of its wireless networks by visitors to its facilities, said Richard Stone, mobility solutions manager at the vendor's HP Americas division. The rules now subject guest users to the same Internet filtering procedures that are applied to HP employees, Stone said.

Allan Thompson, CEO of Senforce Technologies Inc. in Cupertino, Calif., said his company has developed location-aware security software that automatically configures settings on PCs and mobile devices to prevent hackers or network sniffers from gaining unauthorized access to data when the systems are connected to public-access WLAN hot spots. ▶

MORE ONLINE

A Commerce Department IT manager details a series of wireless trends:
QuickLink 38275

GM's CTO Tony Scott talks about the development of wireless-dependent cars:
QuickLink 38303
www.computerworld.com

CRM Apps Take Flight at Aircraft Makers

BY MARC L. SONGINI

Facing gloomy market conditions, large airplane makers like Raytheon Aircraft Co. and The Boeing Co. are rolling out CRM applications in a bid to boost sales and improve their customer service capabilities.

Raytheon Aircraft in November went live with call center, sales and service applications developed by Siebel Systems Inc., said Ed Dolanski, vice president of customer support at the Wichita, Kan.-based maker of business jets and personal planes. About 170 Raytheon employees are using the CRM system.

Prior to the Siebel rollout, there was no formal CRM system in place at Raytheon Aircraft, a subsidiary of Lexington, Mass.-based Raytheon Co. "We identified that we didn't have any type of customer memory, and we cleaned up our act," Dolanski said.

He wouldn't disclose the project's cost but said Raytheon Aircraft has already recovered $1.4 million of its investment through increased sales. The Siebel applications were installed for 13% less than originally budgeted and were in use four weeks ahead of schedule, Dolanski added. Now the company plans to extend the software to its airport service centers so workers there can access relevant information about aircraft owners.

Saving Time and Money

Chicago-based Boeing's commercial aviation services unit is preparing to retire a mix of homegrown Unix and mainframe CRM applications in favor of Siebel's call center software, said Gabe Hanzeli, information systems director for technical services and modifications at the Boeing division.

Hanzeli said the new system will cost several million dollars and is due for a test rollout in the first half of next year. The Siebel software will let Boeing's aircraft support staff access customer data from a single screen, he said.

Hopefully, that will reduce the time it takes to answer questions from customers, Hanzeli noted. Boeing also expects the Siebel rollout to reduce its internal application maintenance costs.

CRM is just starting to gain momentum in the aviation industry, said Sheldon Tkatch, a senior project manager at Garrett Aviation Service Centers, a Tempe, Ariz.-based provider of plane maintenance and modification services. In January 2002, Garrett began using hosted sales and service applications from Salesforce.com Inc. The software has helped Garrett become more proactive in tracking sales opportunities and contacting customers, Tkatch said.

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COMPUTERWORLD

U.S. Agencies Defend Data Mining Plans

BY GRANT GROSS
WASHINGTON

Government officials in charge of two data mining projects that have been criticized by privacy advocates told Congress last week that the information to be collected will be much more limited in scope than opponents have feared.

James Loy, director of the U.S. Transportatioo Security Administratioo (TSA), and Anthony Tether, director of the Defense Advanced Research Projects Agency (DARPA), both tried to assuage concerns that large amounts of personal data about U.S. citizens will be gathered and stored as part of the two IT projects. Loy and Tether testified at a House subcommittee hearing on whether data mining programs could help improve national security.

The proposals have also come under fire from members of Congress who have questioned how the data mining technology will be used and what kind of databases will be created. Rep. William Clay (D-Mo.) said at the hearing that the projects have "a dark cloud of secrecy" hanging over them.

Targeting Terrorists

The TSA's Computer Assisted Passenger Prescreening System II (CAPPS II) will analyze the name, address, phooe number and birth date of airline passengers, in an effort to detect terrorists. Loy declined to comment oo bow the TSA will decide whether a passenger should be let on a plane or questioned further.

But CAPPS II should reduce the number of false positive identifications that the government's existing airline-passenger profiling system produces, Loy said. He called the curreot technology flawed because it lacks sophisticated methods of predicting passenger behavior.

Loy said the TSA expects to roll out CAPPS II by mid-2004. The ageocy has no plans to save information about travelers who aren't flagged as possible terrorists, he added.

Tether said DARPA's Total Information Awareness (TIA) research project is designed to provide the FBI and other federal agencies with tools that can be used to mine data. But DARPA doesn't plan to collect any data itself, he said.

When asked how DARPA will ensure that personal information caught in TIA's net is correct, Tether said that's up to potential users like the FBI.

"We're not the people who collect the data," he said. "We're the people who supply the analytical tools to the people who collect the data."

Gross is a reporter for the IDG News Service.

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9:00am to 9:45am	**Industry Update** **Evaluating Your IT Sourcing Options** Bart Perkins, Managing Partner, Leverage Partners
9:45am to 10:15am	**Business Case Study** James Beattie, EVP and CTO, CCC Information Services
10:15am to 10:30am	Refreshment Break
10:30am to 11:30am	**Outsourcing Strategies** **Leadership Strategies in Offshore Outsourcing** Moderator: Maryfran Johnson, Editor in Chief, Computerworld Panelists: ■ Jerry McElhatton, Senior EVP of Global Technology and Operations, MasterCard International ■ Joe Drouin, VP and CIO, TRW Automotive ■ Tasos Tsolakis, VP of Global Technology Operations, Global Exchange Services ■ James Beattie, EVP and CTO, CCC Information Services
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PATRICIA KEEFE

IT Does Matter

KICKING UP THE DEBATE on the future of IT another notch is Nicholas G. Carr's sure-to-be-controversial contention in this month's *Harvard Business Review* that the pervasiveness of IT will soon make it strategically irrelevant. Summing up his position is the article's headline: "IT Doesn't Matter."

Bam! Now there's a stance sure to stir up some conversatioo around the data banks. (To read an interview with Carr, turn to page 44.)

On the one hand, the very pervasiveness of IT, coupled with two other trends — the increasingly technically literate population, and the rising integratioo of computer technology into everything from cars to clothes dryers to clothing — severely diminishes the mystique that has always surrounded IT.

The idea is that IT has become as ordinary, albeit as key, as the less glamorous accounting or manufacturing departmeots. You can't ruo a company without them, hut they're nothing to get excited about. Everyone has these departments, and they pretty much do the same things. Carr reasons, then, that these departments have lost whatever competitive or strategic edge they might have once provided.

And there is some truth to that. For example, right oow, we're all using cell phones, desktop PCs and laptops, and a goodly portioo of us are using wireless devices. Yes, there will be another wave of technology. There always is. It's like a force of nature that you can't hold back. Carr is right again when he says everyone will eventually line up to use that next advance in technology, creating a level playing field. For him, it's enough that IT filters, adapts and manages these evolutions.

But technology has the potential to succeed io permeating almost every aspect of our lives and the products we use. Some might say that creating all that new stuff woo't be IT's job. The R&D, manufacturing and design groups will be respoosihle for weaving technology advances into consumer goods. The question, then, for IT folks is: What role will we play?

IT has more to offer than mere supervision. It could become a comhinatioo of tech adviser and testing lah for many of these products. Or it could morph away from building pure technology systems that run a business and toward building technology into the services and products the business sells. You can't get more aligned with business goals than that!

General Motors is off to a good start here. Corporate CIO Ralph Syzgeoda years ago teamed each of his group CIOs with specific department heads. He wanted his CIOs to uoderstand the business they were serving and to be on the front lines, ready and ahle to partner oo creating solutions to husiness prohlems.

And that is just ooe model. Unlike Carr, I doo't think IT has to dissolve into an entity that is strictly focused on maintenance, risk avoidance and cost-cutting. Astute CIOs are already practicing this io some form or another.

Yet if you spend too much time oursemaiding the past or practicing risk mitigation in the preseot, theo the future — and opportunity along with it — will be here and gooe before you know it. We still need IT leaders who can think conceptually, who can dream of ways to further husiness goals via technological advances. No matter what your present circumstances, you oeed to keep an eye on the future.

Carr advocates taking a more defensive posture toward IT investmeots. But sometimes the best defense is a good offense. What's needed now is to go back to the chalkhoard and figure out the hest strategy. ◗

PIMM FOX

IT Warning: No Badge, No Access

IMAGINE THIS SCENARIO: You leave your computer unattended while you're in a meeting, and someone uses it to send e-mail with sexual innuendos to a co-worker. Next thing you know, an HR representative is asking you to do some explaining.

Or what about shared computers in hospitals, call centers or financial services firms with open floor plans? Chances are, users are expected to log off the network every time they walk away from the terminal. That's supposed to thwart unauthorized access to personal or sensitive information.

But that rarely happens.

Instead, users depend on you to babysit their security needs. They want you to huild and install systems to guard against their own lapses, which, as you know, are the biggest threat to fundamental security policies and procedures. People just don't make the effort, and until something awful happens, you can't eveo get them to rid their monitors of yellow sticky notes with scribbled passwords. That's why IT security has to include physical systems woveo into the daily routine of each employee.

A new and potentially ubiquitous optioo involves RF-based smart cards linked to fingerprint readers that connect via the USB port. The smart card allows for a security oet of your choosing — from 1 to 10 meters. If you travel outside of that range, the computer locks up. Come back within range, and the screen reverts to the last image. This wireless system relies oo a unique personal identifier encrypted into an RF badge.

Coupled with the fingerprint reader — another IT security watchdog — this device enables you to determine who has used any computer at any given time. In addition, if more than one person has access to a particular PC, the screen will revert to the im-

age appropriate for each user.

Manufactured by a small St. Louis-based company, Access Denied Systems Inc., these systems are being used at Washington University, also in St. Louis. They are one type of what I predict will be myriad vendor offerings that link physical security and access to IT systems.

It's a good way to take aim at unauthorized access from within an enterprise. That type of system could be especially important in health care and financial services companies, where new government regulations are designed to protect patient and customer confidentiality.

There's no panacea for security threats. Firewalls, software protection and password management schemes are for naught if you've already got a Trojan horse who parks in the company lot.

MICHAEL GARTENBERG

Wi-Fi: Why and Why Not

WITHOUT A DOUBT, one of the few growth areas of the industry today is wireless network technology built around the 802.11x standard. According to my company, Jupiter Research, corporate deployment of 802.11 devices (including adapter cards and access points) will reach 99 million by 2008, up from 14 million in 2003 — representing a compound annual growth rate of 48%.

The primary key to this growth will be standards compliance. The expected ratification of 802.11g and 802.11i this year will provide the backward compatibility and security that enterprises seek, while combined industry efforts led by Intel (with its Centrino chip), Cisco Systems and the Wi-Fi Alliance will help interoperability between vendor products and simultaneously raise corporate awareness.

There are a number of benefits to deploying corporate wireless LANs, which should put them on most IT departments' to-do lists in 2003. But you need to know a few caveats.

There are cost savings associated with using a WLAN instead of traditional wired technology, but saving money isn't going to be the biggest driver. Rather, the additional productivity gains associated with wireless are what make WLANs useful and, combined with the cost savings, create a powerful argument to get a WLAN project approved.

Before you run out and start cutting purchase orders for Wi-Fi access points, remember that one size WLAN does not fit all organizations. Organizations of different sizes will have different issues to resolve. Large companies will have greater concerns about security and will be focused on the confusion over evolving security standards that hinder adoption in that market. Smaller businesses should first focus on justifying initial start-up costs and look for ways to lower those as much as possible. These problems are critical for IT departments to address prior to implementation but can be easily resolved with some upfront planning.

For smaller companies, one way to drive down costs is to use existing standards-based products, such as those with 802.11b technology. That approach is technically viable and ensures compatibility with future investments. As costs for 802.11b equipment fall further, these purchases will be much easier to justify.

Big companies should also support existing standards, such as 802.11b, but in addition they need a road map toward 802.11g and 802.11i compliance in the products they buy via software and/or firmware upgrades. They should be prepared to offer multimode and 802.11g products once these standards are fully ratified. While large companies are least likely to be concerned about backward compatibility, they would be best served by taking a risk-averse approach and waiting for ratified 802.11g technology rather than risking short-term deployments of equipment that may become expensive to upgrade or may not interoperate with new gear.

Finally, improved security must become an important factor in selecting WLAN products. This remains the biggest barrier to wide-scale deployment.

The power of WLANs is readily apparent. The productivity of knowledge workers greatly increases when mobile technology — lightweight laptops, Tablet PCs and powerful handheld devices — are enhanced with high-speed WLAN connections. Because more users are dependent on network connections in order to be productive, WLANs can help extend this reach and therefore justify their costs in terms of ROI gained. The key is to balance the gains and focus on the issues that are appropriate to your business, then deploy and watch the accolades come into your in-box — wirelessly, of course.

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READERS' LETTERS

Thoughts on Giving CFOs Project Info

CIOs NEED to be careful about what they reveal to the CFOs who want information for quarterly earnings reports that comply with the Sarbanes-Oxley Act ["CFOs Push IT Managers for More Info About Projects," QuickLink 37988]. Strategic projects and investments in IT make the future of the company. If this information is made public, close scrutiny by competitors can reveal a lot about company direction.

Nauman Sheikh
Functional architect, Metavante Corp., Milwaukee

CFOs AND THEIR C-level peers, including CIOs, should have been doing this a long time ago. If they haven't, they deserve the problems that have arisen. I moved from being the manager of a $300 million chemical plant to managing IT projects 10 years ago precisely because of the issue raised by this article. I have delivered value because I didn't let the geeks BS the organization about why they didn't have to follow the laws of ROI.

Fred Fickling
Dallas, gungh@yahoo.com

THE INSTALLATION of system development methodologies would solve all the problems described in the article, but CIOs would have to sacrifice some of their "smoke-and-mirrors" power. International experience with methodologies has proved their worth. Sadly, being on time and under budget isn't as important to IT departments as retaining power.

Andrew H. Olson
Managing director, Team International Group, Gainesville, Fla., teamolson@bigplanet.com

Don't Export Jobs

MACHIAVELLI said not to use mercenaries: If they're lousy, they'll lose your kingdom for you, and if they're good, they'll take it away from you. My corollary: The same thing goes for outsourced IT workers ["Exporting IT Jobs," QuickLink 38007].

Stewart Dean
Unix Systems administrator, Bard College, Annandale-on-Hudson, N.Y., sdean@bard.edu

MAYBE WE SHOULD outsource U.S. executive managers, with their excessive pay and perks, instead of IT workers. After all, managers consume most of the overhead. Any decent, educated person with common sense can perform their job functions.

It won't be the Chinese, the Vietnamese, the Russians or all of the terrorists combined who destroy this country; it will be American business.

Greg Maschak
Cleveland

NOW I REALIZE why they call it "Blue Monday." Sheesh, could you run these depressing stories on Thursdays?

Michael Jones
Programmer/analyst, Savannah, Ga., enojones@email.uoplx.edu

A World View

I CAN HIRE in places like India, Pakistan, Russia and the Philippines managers and security experts with better qualifications than you'll be likely to find in any company in the U.S.

In fact, I suggest that most of our legislators, CIOs and government contractors should be drawn from the ranks of the hungry and hard-working, college-educated personnel available in those places.

Sending work offshore is the economic equivalent of people voting with their feet. Hopefully, the inevitable equilibration of wage levels across all nations whose borders aren't closed to commerce will eventually result in everybody in the world being better off, and not in the U.S. becoming a Third World country, with barefoot, starving people.

David M. Eaves
CEO, Internet Security Corp., Sunnyvale, Calif.

COMPUTERWORLD welcomes comments from its readers. Letters will be edited for brevity and clarity. They should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. E-mail: letters@computerworld.com. Include an address and phone number for immediate verification.

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computerworld.com/letters

Dave Passmore is the Virginia-based Research Director for the Burton Group. Named one of Network World Magazine's "50 Most Powerful People in the Networking Industry," Passmore is Burton Group's "thought leader" in the area of network architecture.

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ask THE EXPERT

A few minutes with Dave Passmore, Research Director, Burton Group

Mobility—Access Anywhere, Anytime

> The term "mobility" is being used in many different contexts. How do you define it?

Increasingly, the meaning of mobility is becoming aligned with the concept of "untethered communications" — it assumes portable devices that will support some type of wireless voice or wireless data networking functionality. Mobility implies the use of wireless LANs, cellular phone systems or various wireless wide-area or metro networking services. Ultimately, mobility will permit a device such as a laptop computer or personal digital assistant (PDA) to seamlessly roam between these various wireless communications systems without the user having to reconnect or login again. In this context, wireless geographical coverage will be ubiquitous.

> Public Wi-Fi (802.11) wireless networks are emerging as an attractive alternative to cellular networks. What are the benefits driving this growth? What are potential barriers to Wi-Fi's successful deployment as a public carrier service?

The emerging industry view is that public Wi-Fi networks will be complementary rather than competitive to cellular networks. In fact, many of the public Wi-Fi hotspots are allied with or operated by cellular carriers in an attempt to provide comprehensive local and wide-area wireless coverage along with a single monthly bill for customers. Wireless LAN (WLAN) hotspots are becoming extremely popular due to their ease of use and the abundant Internet access bandwidth provided — more than 10 times what's provided by the latest cellular data network offerings.

> Convergence of voice and data communications is accelerating on traditional wireline networks. Do you see convergence on wireless networks also gaining wide acceptance? How soon?

Voice/data convergence is already happening in the wide area, as next-generation 2.5G and 3G data networking services are being added to cellular voice networks. But many businesses are expected to implement their own converged wireless networks that support Wi-Fi phones. Some issues must be addressed to ensure traditional "total quality" voice, but these challenges should be worked out with products that implement the new 802.11e WLAN quality of service standard within the next two to three years.

> Enterprise-wide deployments of WLANs can become very complex to implement and manage. Do you see a strong market opportunity for managed services of WLANs?

Some organizations will choose to outsource the management of their WLANs in the same way that they outsource managed services for their wired LAN and WAN infrastructures. However, one of the hottest new technology developments may address much of the WLAN complexity issue. About a dozen vendors (startups and established vendors) have introduced "WLAN switches" that re-architect a site's WLAN environment into a single integrated system and simplify the administration, security and deployment of complex WLAN environments. Of course, the installation and life-cycle management of these next-generation WLAN systems also represents an opportunity for managed services providers and systems integrators to provide their expertise in this sector.

> The adoption of wireless-enabled devices (both laptops and PDAs) is creating a management nightmare for IT to support. Do you see the management of mobile devices as another strong market opportunity for managed services?

The management of laptops and PDAs is certainly much more complex than it used to be; operation often requires "locking down" these devices so that they can't pick up stray viruses, and to ensure that appropriate security measures are used. An important issue is establishing comprehensive security policies for wireless-enabled devices — particularly when employees want to purchase and use their own low-cost PDAs or laptops on corporate networks. Many organizations are turning to managed services providers for help in this area.

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—Curtis Robb, Delta Air Lines CIO, Delta Technology CEO

Wading Into IP Telephony
A hybrid IP/PBX approach allows some companies to realize the benefits of IP telephony without taking an expensive plunge. **Page 28**

QUICKSTUDY
Fighting Spam
Software that controls the flow of unwanted commercial e-mail uses a variety of techniques, including blacklisting, "whitelisting" and Bayesian analysis, to keep up with the spammers. **Page 33**

FUTURE WATCH
Computers That Cajole
Persuasive technologies, which are striving to use computers to change attitudes and behaviors, will require a new sensitivity on the part of developers and IT managers. **Page 32**

Automated TO THE CORE

Data center automation software promises to help companies cut administrative costs and improve efficiencies. By Jaikumar Vijayan

FRANKLIN HAMERMAN

AS A COMPANY that hosts supply chain operations for customers such as Verizon Wireless and the U.S. Postal Service, New Breed Inc. has a crucial need for infrastructure availability and reliability.

As part of its efforts on those fronts, the company is using software from Opsware Inc. in Sunnyvale, Calif., to automate several day-to-day operational tasks across its data centers.

Manual administrative duties such as making configuration changes, upgrading applications and rolling out patches have been automated using the software. And Opsware has also allowed High Point, N.C.-based New Breed to boost its disaster recovery capabilities through the software's ability to store and use data center configuration data to rebuild downed systems.

The net result: better change management processes, speedier problem resolution and lower administration costs, says New Breed CIO Ashfaque Chowdhury.

"We have about 400 servers with nearly 5TB of data and almost 100 people in our data center," Chowdhury says. The hope is that Opsware's technology will "enable high levels of reliability and reduce cycle time in delivering change at a lower cost," he adds.

New Breed isn't alone. As IT organizations come under increasing pressure to cut costs, expect to see a growing number of them move to automate data center operations, says Corey Ferengul, an analyst at Stamford, Conn.-based Meta Group Inc. Many companies have already tapped other cost-cutting opportunities — through measures such as staff cuts and reduced work hours — and are now looking to data center automation as a new way to rein in costs, Ferengul says.

"This whole automation trend is a pretty fundamental one," says Chowdhury. "You can't be competitive in cost and pricing unless you are able to operate with a lower cost structure."

But to take advantage of such technologies, companies will first need to put in place good processes that easily lend themselves to automation, Ferengul says. Products that are currently available are largely immature and untested in enterprise environments, with most vendors having fewer than 10 customers, he notes.

"It is also still not established what the core criteria is that users are looking for," he says. As a result, "every vendor has their own take and is attacking the market in their own way."

DATA CENTER AUTOMATION

Broadly speaking, data center automation tools aim to enable intelligent and automatic deployment and provisioning of hardware, software, applications and services. The knowledge behind repetitive, time-consuming systems administration tasks — such as upgrading, changing, managing and configuring equipment — is encapsulated into and executed by automation software, based on user-defined preferences and policies.

For example, using such tools, a company could centrally distribute and manage new applications, security patches, user profiles and passwords across data center systems. Or those tools could be used to provision additional hardware or storage resources to applications on the fly.

The savings come from the reduced dependence on systems administrators and the shorter time it takes to implement changes, says Nick Van der Zweep, a director at Hewlett Packard Co.'a Enterprise Systems Group.

A Range of Options

Data center automation tools vary widely in capabilities and functions.

HP's Utility Data Center and Sun Microsystems Inc.'s N1 technologies, for instance, allow users to do on-demand provisioning of consolidated hardware, storage and network equipment. The technologies work by aggregating, virtualizing and sharing such resources across multiple data center applications.

Another example of automation software is Opsware System 3.5, which focuses more on the automation of software processes.

Opsware's technology, for instance, aims to enable automated deployment of operating systems, applications and databases across multiple servers. In addition, it allows users to centrally identify and patch servers that need to be secured and to deploy or roll back code, content and configurations of multiple servers, says Tim Howe, chief technology officer at Opsware.

Provisioning Strategy

Users can define and encapsulate specific policies relating to their application environments — like optimal configuration and security settings — which Opsware uses when deploying applications and services, Howe says.

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The software works by collecting a wide range of infrastructure information from agent software that's installed in data center hardware. A centralized policy engine uses that information when deploying software or making changes that impact the infrastructure. Opsware 3.5 also holds a complete blueprint of the software infrastructure in a data center that allows companies to recover quickly from disasters.

Tira Wireless Inc. in Toronto is using software from Think Dynamics Inc., also in Toronto, to automate the manner in which its hardware allocates resources to applications.

The company is using the ThinkControl software suite to tie its existing Wintel servers to a bank of standby machines with idle capacity. ThinkControl uses informatioo gathered from third-party network management products such as HP OpenView and Computer Associates International Inc.'s Unicenter to monitor CPU utilization rates on the Wintel servers. When CPU utilization on any box exceeds a certain threshold, the software automatically kicks in and brings in fresh resources from the standby pool, says Chris Prendergast, Tira's director of operations.

When CPU utilization drops below the predefined threshold, ThinkControl automatically releases the excess capacity back to the common pool.

The approach has eliminated the need to continually add and configure hardware to handle workload spikes, Prendergast says. Many of the capacity planning and performance monitoring tasks that used to be done manually are now done by ThinkControl.

"We were having a difficult time modeling the hardware requirement to support users as adoption [of Tira's services] ramped up," Prendergast says. Without Think Dynamics' software, the option would have been to buy large, grossly underutilized dedicated systems for each application to handle unexpected spikes.

The temporary provisioning offered by Think Dynamics "is proving to be a better option," Prendergast says.

Identifying Targets

Some tools aim to help users automate key data center administration tasks.

Investment firm Lehman Brothers Holdings Inc., for instance, is using software from New York-based Thor Technologies Inc. to automate the administration of user application access rights, according to Tom King, chief information security officer at Lehman Brothers.

The software automatically controls user access to applications based on policy and keeps up with changes to business rules or employee status, without requiring the administrator to reset or change anything, according to Nancy Colwell, a director at Thor.

"Just like any other firm our size, it is quite a challenge to efficiently and consistently apply all of the different rules around user provisioning to get people into and out of systems quickly [and reliably]," King says. Lehman Brothers plans to expand use to all 12,500 of its employees.

"We have takeo all of the manual fingers on keyboard user account creations and automated them," resulting in lower costs and better efficiencies, King says.

But the key to such benefits lies in careful planning, Ferengul says. Care needs to be taken and lots of testing needs to be dooe before companies eotrust key administrative tasks to automation software, says Prendergast.

"There is an aspect of testing and validation this thing needs to go through before it can be deployed," Chowdhury says. "There can be a huge impact on productivity if this thing goes haywire."

This is especially important because the software is still highly immature, he adds.

It's also crucial that the software can be customized to fit an organization's specific needs, King says. Otherwise users can get locked into proprietary interfaces, he says.

And not all processes can be easily automated, Ferengul says. Though a lot of administrative tasks can be codified into such software, there are specialized tasks that cannot.

CHOOSING A VENDOR

For a market that's still evolving, there are a lot of vendors offering data center automation tools, users and analysts say. And while many of the products seem similar on the surface, their capabilities vary.

So prior to choosing one, it's vital to know precisely what your requirements are, find out which vendor meets your specific needs and ensure that the technology really works as billed, says Ashfaque Chowdhury, CIO at New Breed.

For instance, some tools allow users to automate application and hardware provisioning and to track, audit and remediate configurations. Others use infrastructure performance information to determine and fulfill application needs. And still others are focused on pooling, virtualizing and sharing data center hardware, storage and network resources.

"The product categories from a purchaser's point of view are too differentiated" to directly compare, Chowdhury says. "You have to decide based on your needs."

"The most difficult part was just selecting the right application," says Tom King, chief information security officer at Lehman Brothers, which is using automation software from Thor Technologies to provision user access to enterprise applications.

For Lehman, the most important factor was the ability of the automation software to manage not just packaged applications but customized applications as well, King says.

"There are hundreds of applications that are homegrown or proprietary that we needed [the software] to interface with," King says.

Vendor stability should also be considered when making a purchasing decision, says Corey Ferengul, an analyst at Meta Group. Most of the companies in this market are start-ups with fewer than 10 customers, he says.

– Johanna Vijayan

MAJOR PLAYERS AND PRODUCTS

Opsware Inc.
Sunnyvale, Calif.

MAIN PRODUCT: Opsware System 3.6

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BladeLogic Inc.
Bedford, Mass.

MAIN PRODUCT: BladeLogic Configuration Manager

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Wading Into IP Telephony

While some companies are taking the plunge into pure-play IP systems, others are easing forward with a hybrid IP/PBX approach. By Steve Ulfelder

DAVID STEVER, manager of communication technology services at PPL, knows that IP telephony is the future. He also knows that his company (formerly known as Pennsylvania Power & Light) has a massive investment in a traditional voice network. With 3,000 lines and a wiring infrastructure at its Allentown headquarters that Stever describes as "challenging," the utility selected an IP-enabled private branch exchange (PBX) telephone system from Nortel Networks Ltd. when it decided to upgrade its network. "We needed to get our feet wet [with IP telephony], but we needed a proven, mature system," he says.

On the other hand, in 2001, when the Cancer Therapy & Research Center consolidated facilities and expanded its headquarters in San Antonio, the organization was working from a clean sheet of paper — and opted for a pure IP setup from Cisco Systems Inc. Chief Technology Officer Mike Luter says the network's speed and manageability, along with the "increased mobility" enjoyed by physician end users, made pure-play the way to go.

These experiences neatly summarize the telephony choices IT organizations are making today. Legacy PBXs are rapidly being supplanted by IP-enabled "hybrids," which analysts say offer most of the advantages of pure IP systems (such as the ability to easily change extensions and to use a new generation of applications for activities like inventory management) while allowing companies to retain most of their existing infrastructures. But pure-play IP systems, unlike hybrids, let IT organizations manage one network structure rather than two and are useful in small regional offices where it wouldn't make sense to install a PBX.

Bottom line: Pure-play IP telephony is gaining traction primarily (but not exclusively) with organizations that are undergoing other major changes — a headquarters move or consolidation, for example, or any major construction project that entails new cabling.

Hybrid PBX systems — traditional PBXs that use special port cards to make IP telephone connections — are favored by businesses seeking most of the benefits of IP telephony without having to rip out their existing voice network telephone systems. The final choice for IT organizations is driven as much by external factors, such as moves and the addition of remote offices, as by the two systems' benefits.

When the Cancer Therapy & Research Center consolidated its offices from three buildings into two and expanded its headquarters, where most of its 900 PCs and servers and 800 telephones reside, Luter's team evaluated hybrid PBXs from Avaya Inc. and Nortel before settling on an IP telephony setup from Cisco.

Luter says Cisco was a "premium environment," but other factors offset that expense. For starters, the center saved more than $58,000 by running a single wire for voice and data. Cisco's history as a data networking vendor appealed to Luter because the center routinely transmits enormous medical imaging files between facilities. Another benefit is the simplified help desk structure that comes with a single data-and-voice network.

"We've got Windows, Unix machines and Macintoshes, so our help desk faces some pretty complex needs," Luter says. "At least now we don't have one group for the phones and one for the computers; IT supports everything." He adds that getting phone extensions set up for new hires used to take up to two weeks but is now accomplished in less than a day.

Addressing one widespread concern about IP telephony, Luter says the center built redundancies for its phone system into its storage-area network (SAN). Each facility has a redundant pair of Cisco SN 5428 SAN servers.

Some analysts worry that redundancy and fail-over, which have been honed for 100 years in the switched-circuit world, haven't yet been sufficiently addressed in IP telephony systems. "By their very nature, basic PBXs provide fail-over resiliency in the trunks going to the [telephone service provider's] central office," says Laurie Gooding, an analyst at Phoenix-based Synergy Research Group. "An IP system doesn't provide that."

Gooding adds that "some vendors have been slow" to provide redundancy in their IP signaling interfaces — that is, the backup system that kicks in if a server goes down.

But NFL Films has used IP telephony for its 450 phones since July 2001, and Steve Eager, director of network and

IP/PBX Hybrid

Network Diagram: PPL, Allentown and Harrisburg, Pa.

Pure IP Telephony System

Network Diagram: Cancer Therapy & Research Center

systems administration, believes he has planned for almost any problem — with one possible exception.

The Mount Laurel, N.J.-based chronicler of professional football is on a Synchronous Optical Network (Sonet) ring with separate fiber lines into each of its two connected buildings. For redundancy, each building gets a voice gateway, a Cisco Catalyst 6509 switch and a Cisco Call Manager Server (the servers are clustered).

"We're fully redundant," Eager says, noting one exception: Each of the company's eight closet switches is homed to a single 6509 switch. "If we lost a closet switch, we'd lose the phones at that closet," he says, adding that this has never occurred.

Many analysts agree with Brian Strachman, an analyst at In-Stat/MDR in Scottsdale, Ariz., who says, "The fear factor in IP telephony is gone in the last year or so — they've worked out most of the bugs. Whether you buy a [hybrid] system or a pure IP, you're safe in terms of redundancy."

One advance in current hybrid PBXs is peer-to-peer IP switching. In early hybrids, voice-over-IP (VOIP) communication involved translating from traditional voice time-division multiplexing (TDM) to IP, then back to TDM. This round trip introduced the possibility of poor voice quality due to latency. Peer-to-peer IP connectivity is "a cleaner way to accomplish VOIP," says Jay Lassman, an analyst at Stamford, Conn.-based Gartner Inc.

Vendor Pros and Cons

Some IT organizations opt for hybrid PBXs over pure-play IP systems even when they're moving toward full IP telephony. Bow Valley College in Calgary, Alberta, implemented IP telephony in January 2002. Shortly after sending out its request for proposals, the college narrowed its choices to Cisco, Nortel and Alcatel. IT manager Mike Shannon led a team that believed Nortel lacked a "clear strategy" on IP telephony, leaving Paris-based Alcatel and Cisco as finalists.

Misgivings over Cisco's experience with voice networks prompted Bow Valley to choose an Alcatel OmniPCX system. "Cisco concerned us because they weren't voice-based; we weren't sure they understood voice enough," Shannon says. "And we weren't thrilled at the thought of running our voice over Windows 2000 — we need five 9s reliability for our voice traffic."

Shannon says the hybrid PBX offers the advantages of IP telephony — simplified management with Alcatel's OmniVista network management tool, a single architecture and an automated move/add/change procedure — with flexibility not found in pure IP systems, such as the ability to run fax machines from analog ports. Like other newer hybrid PBXs, OmniPCX supports analog, digital, IP, wireless and soft phones.

Thomas Dunkerley, IT communications manager at *The Seattle Times*, concurs with Shannon's assessment of the trade-offs between a data-centric vendor like Cisco, 3Com Corp. or Sunnyvale, Calif.-based Shoreline Communications Inc. on the one hand and a voice-centric vendor like Avaya, Nortel or Siemens AG on the other. When the newspaper decided to replace its 10-year-old Avaya Definity PBX, it explored Cisco's pure-play IP system and hybrid PBXs, and Avaya emerged as the leading hybrid candidate.

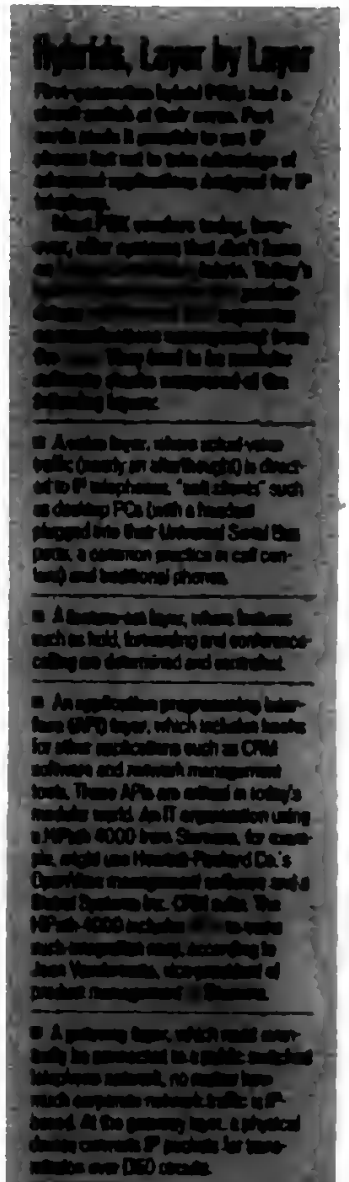
To Dunkerley and his team, all of whom had experience with telecommunications, a drawback to the Cisco products soon became apparent. At *The Seattle Times*, each phone includes three call "appearances," or number listings. PBXs use a single port for each phone; with Cisco, each appearance would count as a port.

"That would have tripled my licenses," Dunkerley says. He adds that this anomaly is probably an example of Cisco's roots in the data world.

The newspaper opted for Avaya, partly because it was the only vendor whose products comply with Americans With Disabilities Act guidelines (offering simultaneous audio and visual paging, for example), but Dunkerley says there were trade-offs involved.

"Avaya's not as focused on data as Cisco is," Dunkerley says, citing Avaya's Cajun P330 switching system. "My network techs tell me the basics and functionality are all there but that the Cisco user interface is cleaner, making management a bit easier," he says. The newspaper has moved 300 end users to IP phones, and 750 more are on tap for the next three months.

Enterprise telephony is moving toward IP; there is little doubt about that. The question is, Do you want to take one giant — but irreversible — step today, scrap everything and go for pure-play IP? Or do you want to take baby steps and install a hybrid PBX, bridging past to future? For NFL Films' Eager, the giant step worked. "You have your Windows guys doing PCs and servers, and your Cisco guy doing all your networking — including phones," he says. "What's simpler than that?"



Hybrids, Layer by Layer

First-generation hybrid PBXs had a distinct outlook of their own. Port cards made it possible to use IP phones but not to take advantage of advanced applications designed for IP telephony.

Most PBX vendors today, however, offer systems that don't have an [illegible] Avaya's [illegible] product [illegible] separate communications management from the [illegible]. They tend to be modular offerings divided among all the following layers:

- A station layer, where actual voice traffic (usually an afterthought) is directed to IP telephones, "soft clients" such as desktop PCs (with a headset plugged into their Universal Serial Bus ports), a common practice in call centers) and traditional phones.
- A feature-set layer, where features such as hold, forwarding and conference-calling are determined and executed.
- An application programming interface (API) layer, which includes hooks for other applications such as CRM software and network management tools. These APIs are critical in today's modular world. An IT organization using a MiPath 4000 from Siemens, for example, might use Hewlett-Packard Co.'s OpenView management software and a Siebel Systems Inc. CRM suite. The MiPath 4000 includes [illegible] to some such integration work, according to Jean Vandevenne, [illegible] of product management at Siemens.
- A gateway layer, which would eventually be connected to a public switched telephone network, no matter how much corporate network traffic is IP-based. At the gateway layer, a physical device converts IP packets for transmission over DSO circuits.
- A call-control layer, where the class of service (such as limitations on international dialing), security policies and a database of registered users are determined.

— Steve Ulfelder

Ulfelder is a freelance writer in Southboro, Mass. Contact him at sulfelder@charter.net.

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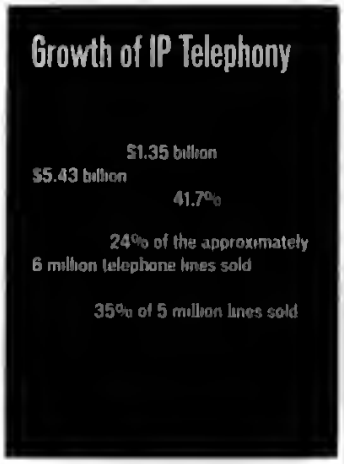
These experiences neatly summarize the telephony choices IT organizations are making today. Legacy PBXs are rapidly being supplanted by IP-enabled "hybrids," which analysts say offer most of the advantages of pure IP systems (such as the ability to easily change extensions and to use a new generation of applications for activities like inventory management) while allowing companies to retain most of their existing infrastructures. But pure-play IP systems, unlike hybrids, let IT organizations manage one network structure rather than two and are useful in small regional offices where it wouldn't make sense to install a PBX.

Bottom line: Pure-play IP telephony is gaining traction primarily (but not exclusively) with organizations that are undergoing other major changes — a headquarters move or consolidation, for example, or any major construction project that entails new cabling.

Hybrid PBX systems — traditional PBXs that use special port cards to make IP telephone connections — are favored by businesses seeking most of the benefits of IP telephony without having to rip out their existing voice network telephone systems. The final choice for IT organizations is driven as much by external factors, such as moves and the addition of remote offices, as by the two systems' benefits.



When the Cancer Therapy & Research Center consolidated its offices from three buildings into two and expanded its headquarters, where most of its 900 PCs and servers and 800 telephones reside, Luter's team evaluated hybrid PBXs from Avaya Inc. and Nortel before settling on an IP telephony setup from Cisco.

Luter says Cisco was a "premium environment," but other factors offset that expense. For starters, the center saved more than $58,000 by running a single wire for voice and data. Cisco's history as a data networking vendor appealed to Luter because the center routinely transmits enormous medical imaging files between facilities. Another benefit is the simplified help desk structure that comes with a single data-and-voice network.

"We've got Windows, Unix machines and Macintoshes, so our help desk faces some pretty complex needs," Luter says. "At least now we don't have one group for the phones and one for the computers; IT supports everything." He adds that getting phone extensions set up for new hires used to take up to two weeks but is now accomplished in less than a day.

Addressing one widespread concern about IP telephony, Luter says the center built redundancies for its phone system into its storage-area network (SAN). Each facility has a redundant pair of Cisco SN 5428 SAN servers.

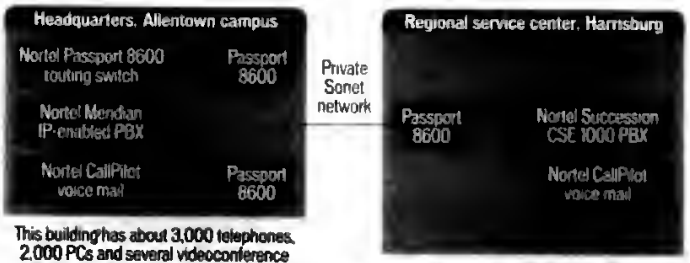
Some analysts worry that redundancy and fail-over, which have been honed for 100 years in the switched-circuit world, haven't yet been sufficiently addressed in IP telephony systems. "By their very nature, basic PBXs provide fail-over resiliency in the trunks going to the [telephone service provider's] central office," says Laurie Gooding, an analyst at Phoenix-based Synergy Research Group. "An IP system doesn't provide that."

Gooding adds that "some vendors have been slow" to provide redundancy in their IP signaling interfaces — that is, the backup system that kicks in if a server goes down.

But NFL Films has used IP telephony for its 450 phones since July 2001, and Steve Eager, director of network and

IP PBX Hybrid

Network Diagram: PPL, Allentown and Harrisburg, Pa.

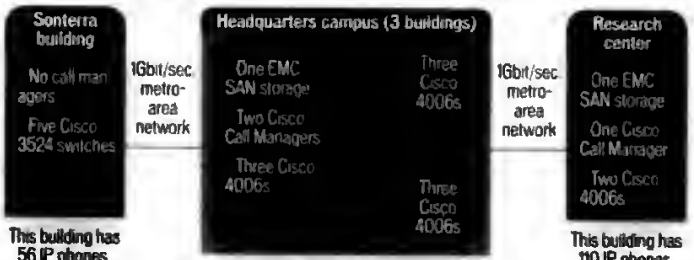


This building has about 3,000 telephones, 2,000 PCs and several videoconference facilities. The Passport 8600s link various campus buildings.

This center has about 500 phones and 400 PCs.

Pure IP Telephony System

Network Diagram: Cancer Therapy & Research Center



This building has 56 IP phones, 30 PCs and other clients.

This campus has 643 IP phones, 574 PCs and other clients.

This building has 110 IP phones, 130 PCs and other clients.

systems administration, believes he has planned for almost any problem — with one possible exception.

The Mount Laurel, N.J.-based chronicler of professional football is on a Synchronous Optical Network (Sonet) ring with separate fiber lines into each of its two connected buildings. For redundancy, each building gets a voice gateway, a Cisco Catalyst 6509 switch and a Cisco Call Manager Server (the servers are clustered).

"We're fully redundant," Eager says, noting one exception: Each of the company's eight closet switches is homed to a single 6509 switch. "If we lost a closet switch, we'd lose the phones at that closet," he says, adding that this has never occurred.

Many analysts agree with Brian Strachman, an analyst at In-Stat/MDR in Scottsdale, Ariz., who says, "The fear factor in IP telephony is gone in the last year or so — they've worked out most of the bugs. Whether you buy a [hybrid] system or a pure IP, you're safe in terms of redundancy."

One advance in current hybrid PBXs is peer-to-peer IP switching. In early hybrids, voice-over-IP (VOIP) communication involved translating from traditional voice time-division multiplexing (TDM) to IP, then back to TDM. This round trip introduced the possibility of poor voice quality due to latency. Peer-to-peer IP connectivity is "a cleaner way to accomplish VOIP," says Jay Lassman, an analyst at Stamford, Conn.-based Gartner Inc.

Vendor Pros and Cons

Some IT organizations opt for hybrid PBXs over pure-play IP systems even when they're moving toward full IP telephony. Bow Valley College in Calgary, Alberta, implemented IP telephony in January 2002. Shortly after sending out its request for proposals, the college narrowed its choices to Cisco, Nortel and Alcatel. IT manager Mike Shannon led a team that believed Nortel lacked a "clear strategy" on IP telephony, leaving Paris-based Alcatel and Cisco as finalists.

Misgivings over Cisco's experience with voice networks prompted Bow Valley to choose an Alcatel OmniPCX system. "Cisco concerned us because they weren't voice-based; we weren't sure they understood voice enough," Shannon says. "And we weren't thrilled at the thought of running our voice over Windows 2000 — we need five 9s reliability for our voice traffic."

Shannon says the hybrid PBX offers the advantages of IP telephony — simplified management with Alcatel's OmniVista network management tool, a single architecture and an automated move/add/change procedure — with flexibility not found in pure IP systems, such as the ability to run fax machines from analog ports. Like other newer hybrid PBXs, OmniPCX supports analog, digital, IP, wireless and soft phones.

Thomas Dunkerley, IT communications manager at *The Seattle Times*, concurs with Shannon's assessment of the trade-offs between a data-centric vendor like Cisco, 3Com Corp. or Sunnyvale, Calif.-based Shoreline Communications Inc. on the one hand and a voice-centric vendor like Avaya, Nortel or Siemens AG on the other. When the newspaper decided to replace its 10-year-old Avaya Definity PBX, it explored Cisco's pure-play IP system and hybrid PBXs, and Avaya emerged as the leading hybrid candidate.

To Dunkerley and his team, all of whom had experience with telecommunications, a drawback to the Cisco products soon became apparent. At *The Seattle Times*, each phone includes three call "appearances," or number listings. PBXs use a single port for each phone; with Cisco, each appearance would count as a port.

"That would have tripled my licenses," Dunkerley says. He adds that this anomaly is probably an example of Cisco's roots in the data world.

The newspaper opted for Avaya, partly because it was the only vendor whose products comply with Americans With Disabilities Act guidelines (offering simultaneous audio and visual paging, for example), but Dunkerley says there were trade-offs involved.

"Avaya's not as focused on data as Cisco is," Dunkerley says, citing Avaya's Cajun P330 switching system. "My network techs tell me the basics and functionality are all there but that the Cisco user interface is cleaner, making management a bit easier," he says. The newspaper has moved 300 end users to IP phones, and 750 more are on tap for the next three months.

Enterprise telephony is moving toward IP; there is little doubt about that. The question is, Do you want to take one giant — but irreversible — step today, scrap everything and go for pure-play IP? Or do you want to take baby steps and install a hybrid PBX, bridging past to future? For NFL Films' Eager, the giant step worked. "You have your Windows guys doing PCs and servers, and your Cisco guy doing all your networking — including phones," he says. "What's simpler than that?"

Ulfelder is a freelance writer in Southboro, Mass. Contact him at sulfelder@charter.net.

Hybrids, Layer by Layer

First-generation hybrid PBXs had a circuit switch at their cores. Port cards made it possible to use IP phones but not to take advantage of advanced applications designed for IP telephony.

Most PBX vendors today, however, offer systems that don't have an integral switching fabric. Today's hybrids have migrated to a packet-driven architecture that separates communications management from the core. They tend to be modular software stacks composed of the following layers:

- **A voice layer**, where actual voice traffic (nearly an afterthought) is directed to IP telephones, "soft clients" such as desktop PCs (with a headset plugged into their Universal Serial Bus ports, a common practice in call centers) and traditional phones.
- **A feature-set layer**, where features such as hold, forwarding and conference-calling are determined and controlled.
- **An application programming interface (API) layer**, which includes hooks for other applications such as CRM software and network management tools. These APIs are critical in today's modular world. An IT organization using a HiPath 4000 from Siemens, for example, might use Hewlett-Packard Co.'s OpenView management software and a Siebel Systems Inc. CRM suite. The HiPath 4000 includes APIs to make such integration easy, according to Joan Vandermate, vice president of product management at Siemens.
- **A gateway layer**, which must eventually be connected to a public switched telephone network, no matter how much corporate network traffic is IP-based. At the gateway layer, a physical device converts IP packets for transmission over DS0 circuits.
- **A call-control layer**, where the class of service (such as limitations on international dialing), security policies and a database of registered users are determined.

– Steve Ulfelder

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Computers That Cajole

Persuasive technologies are aimed at changing users' attitudes and behaviors. By Matt Hamblen

WE ALL KNOW ways that computers employ psychology to change our attitudes or behaviors.

Mostly, we see it on Web sites. A widely used technique involves providing a fun game to play or a captivating video that might have no other purpose than to get us to linger on a site or bookmark it.

If we e-mail a link for the site to a friend, the site and its technology and designers have altered our behavior slightly. The process creates a new attitude or alters an old one about the site or the brand and products behind it.

Web sites and applications use a growing variety of persuasive techniques to alter our attitudes and behaviors, and after the bursting of the dot-com bubble, there is increasing interest in "stepping back to see what really works and persuades," says B.J. Fogg, director of the Persuasive Technology Lab at Stanford University. He also coined the term *captology*, the science of using "computers as persuasive technologies."

In the coming years, Fogg says, captology is likely to challenge IT managers and traditional business leaders, who will see persuasive techniques become an important part of business training, management coaching and marketing.

He says captology will be used to motivate people to make better use of computers by offering helpful hints when problems occur in early uses of a new application. Applications will send e-mails that praise workers for trying them, Fogg says.

Captology will require developers to understand behavioral science as it applies to technology, Fogg says. "IT managers might not think captology is appropriate for computers and will ask why persuasion should be a part of it," he says. "They will wonder, 'Does this work, and is this relevant to my company or job?' "

FUTURE WATCH

Fogg ticks off a list of applications and laboratory studies indicating that captology does indeed work. In studies of human/computer reciprocity, users were discovered to be far more willing to do simple tasks for a computer, such as signing up for a newsletter or upgrading software, if the computer had provided them useful information and told them so. "The computer points to good work it's done for you, much as a good employee tells a boss, 'I've done this and this,' before asking for a raise," he says.

For example, Fogg says, a successful virus-protection program could be even more successful if it counted how many times it blocked a virus on a computer and when, then reported that information to the user before reminding him to upgrade or renew.

RSIGuard Software in Santa Cruz, Calif., has developed software that helps users protect against repetitive-stress injuries by monitoring how much they use the keyboard and mouse and encouraging them to take regular breaks when at work. They are persuaded to use the program because it's seen as offering relief and because it can be tailored to suit the individual's workstyle and tolerances, says Ron Goodman, a project manager at RSIGuard.

Another example of captology is America's Army, a simulation and online game created to provide insights about U.S. Army life, teamwork and training. The game, which cost $10 million to develop, is part of the Army's official communications strategy, according to an explanation on the *www.americasarmy.com* Web site.

Fogg says the site has "worked in spades" at bringing in recruits who are excited by the computer-based experiences. It has worked so well that it's "kind of scary, to be honest," adds Fogg, who worries that there might not be enough checks and balances to protect people from government abuse of powerful persuasive techniques.

U.S. Army Col. Casey Wardynski, the creator of America's Army, says the game has become one of the most popular online games globally since it was launched in July. He agrees that it uses many persuasive technologies, but only at a very early stage in the recruiting process.

Fogg says that many applications of captology in the workplace are coming. They include everything from using behavioral science in software in order to increase output per employee in a call center to improving managers' skills, especially with delegating, setting goals and getting people to arrive at meetings on time.

The trick, Fogg believes, will be getting developers to write software that motivates based on positive rewards, reminding users that they will be happier and better at their jobs if they take certain actions.

"IT shops will have a role in integrating all of these captologies," Fogg adds.

UNDER THE INFLUENCE

To learn more about some technologies that are unpersuasive, go to:
QuickLink 38073

Corporate IT shops could learn a lot from the America's Army online simulation game:
QuickLink 38295
www.computerworld.com

Fighting Spam

DEFINITION

Software that controls **spam** — unsolicited commercial mass e-mail sent over the Internet — uses techniques such as blacklisting or "whitelisting" particular URLs or domain names, and includes self-learning programs based on statistical analysis.

BY RUSSELL KAY

EVERY DAY most of us get e-mail offering to sell us drugs (especially Viagra), vacations, ways to enlarge specific parts of our bodies, get-rich-quick schemes, cable-television descramblers, lower mortgage rates and Internet-based pornography. I don't want it, and neither do you. Spam has become a serious and growing problem for Internet users, affecting individuals and corporations alike.

QUICK STUDY

Spam costs its recipients money. David Ferris, president of San Francisco-based Ferris Research, estimates that spam and efforts to combat it cost U.S. companies $8.9 billion in 2002.

In a December 2002 report, Gartner Inc. analyst Joyce Graff predicted that "by 2004, unless an enterprise takes defensive action, more than 50% of its message traffic will be spam." Ferris analyst Marten Nelson pegs the volume of spam at 20% to 30% of corporate traffic and 40% to 50% of Internet service provider traffic. Nelson says that CIOs and corporate messaging managers should consider three major elements in determining the impact of spam.

"First, you need to look at the costs associated with loss of user productivity, then the cost to the messaging infrastructure and finally the cost to your help desk in dealing with user complaints," he says.

Strategies

There are dozens of products and services available to help block spam. They use the following basic techniques:

■ **Blacklist the sender.** Get a list of spammers' addresses and block any e-mail from those addresses. This can't block spam from new addresses, however, so there's a constant race between the spammers and the spam-fighters. At times, the blockers get too eager and may shut off all mail from a specific domain name, blocking legitimate messages from nonspamming users.

■ **"Whitelist" the sender.** The opposite approach is to accept e-mail only from a list of approved addresses. This is highly effective but not terribly practical, especially for business users who want to hear from new customers.

■ **Look for telltale signs.** Spam messages tend to have a lot of features in common. According to CipherTrust Inc., some of the more common elements found in the subject lines of spam are "$," "!," "999," "Credit," "Earn," "FREE," "Free," "Get," "Lose" and "Money."

■ **Keep score.** Much antispam software relies on analyzing message IDs, formats and other traits, assigning values to each identified feature and adding up a numerical score for new messages. If the score exceeds a specified limit, it's considered spam and is blocked. Unfortunately, this approach delivers a lot of false positives, rejecting mail that isn't spam.

■ **Learn as you go.** The most promising approach seems to be Bayesian filtering, which is based on statistical analysis. With this method, you train the software by classifying mail as spam or nonspam. Based on your classifications, the software analyzes new messages and determines the probability that they may be spam. Bayesian programs continually learn, and if a spam message slips through, you tell the program and it becomes smarter.

Tips for Avoiding Spam

There are ways you can fight spam in addition to software tools, including the following:

■ Don't opt out. Your opt-out or "unsubscribe" reply merely confirms your valid e-mail address and is likely to get you more, not less, spam.

■ Stop giving away your address. In March 2003, the Washington-based Center for Democracy and Technology reported on research into where spammers get their addresses. The overwhelming source (97%) was public Web sites. In fact, every single normal address they posted on a Web site received some spam. They also obscured some addresses by making them look like running text (joe@mycompany.com becomes "joe at mycompany dot com") or by converting them to HTML (Joe's address now reads joe@mycompany.com). Obscured addresses got no spam at all.

■ **Counterattack the spammers.** Alan Ralsky, who has been previously convicted of fraud, is possibly the world's premier spammer, sending out upward of a billion e-mails a day. After Slashdot.com publicized a *Detroit Free Press* article on Ralsky and listed his home address, the antispam community signed him up for numerous ad campaigns and multiple mailing lists. Ralsky has since been inundated with truckloads of brochures, ads and catalogs, all delivered by the U.S. Postal Service to his brand-new $740,000 home in West Bloomfield, Mich. Ralsky, unamused, considers this harassment.

The Bottom Line

Spam seems here to stay. It's too easy, too cost-effective and too cheap to kill entirely. But we can take effective measures to block most of it.

"Yes, it's a cat-and-mouse game between the spammers and the antispam vendors, but I believe the antispam vendors will win," says Ferris Research's Nelson. "In the next five years or so, we will look at the spam problem much as we look at viruses today. It used to be a serious problem, but now it's fairly well under control."

Kay is a Computerworld contributing writer in Worcester, Mass. You can contact him at russkay@charter.net.

Enterprise-Class Spam-Fighters

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www.activestate.com/products/puremessage

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San Francisco
www.brightmail.com/enterprise-as.html

IronMail
CipherTrust Inc.
Alpharetta, Ga.
www.ciphertrust.com/ironmail/

Authority
Cloudmark Inc.
San Francisco
www.cloudmark.com/products/authority/

Gordano Messaging Suite
Gordano Ltd.
North Somerset, England
www.gordano.com/technology/anti-spam.htm

Lyris MailShield Server
Lyris Technologies Inc.
Berkeley, Calif.
www.lyris.com/products/mailshield/

MailFrontier Anti-Spam Gateway
MailFrontier Inc.
Palo Alto, Calif.
www.mailfrontier.com/enterprise_overview.html

SpamKiller
Network Associates Inc.
Santa Clara, Calif.
www.networkassociates.com

Postini
Postini Corp.
Redwood City, Calif.
www.postini.com/services/

Proofpoint Protection Suite
Proofpoint Inc.
Cupertino, Calif.
www.proofpoint.com/product-spam-and-spam.html

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The Bottom Line

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"Yes, it's a cat-and-mouse game between the spammers and the antispam vendors, but I believe the antispam vendors will win," says Ferris Research's Nelson. "In the next five years or so, we will look at the spam problem much as we look at viruses today. It used to be a serious problem, but now it's fairly well under control."

Kay is a Computerworld contributing writer in Worcester, Mass. You can contact him at russkay@charter.net.

Enterprise-Class Spam-Fighters

PureMessage 3.0
ActiveState Corp.
Vancouver, British Columbia
www.activestate.com/products/puremessage

BrightMail Anti-Spam Enterprise Edition Release 4.5
Brightmail Inc.
San Francisco
www.brightmail.com/enterprise-as.html

IronMail
CipherTrust Inc.
Alpharetta, Ga.
www.ciphertrust.com/ironmail/

Authority
Cloudmark Inc.
San Francisco
www.cloudmark.com/products/authority/

Gordano Messaging Suite
Gordano Ltd.
North Somerset, England
www.gordano.com/technology/anti-spam.htm

Lyris MailShield Server
Lyris Technologies Inc.
Berkeley, Calif.
www.lyris.com/products/mailshield/

MailFrontier Anti-Spam Gateway
MailFrontier Inc.
Palo Alto, Calif.
www.mailfrontier.com/enterprise_overview.html

SpamKiller
Network Associates Inc.
Santa Clara, Calif.
www.networkassociates.com

Postini
Postini Corp.
Redwood City, Calif.
www.postini.com/services/

Proofpoint Protection Suite
Proofpoint Inc.
Cupertino, Calif.
www.proofpoint.com/product-mps-mod-spam.html

SPAM FROM THE START

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Reserve Call-up Hits IT Security Department

When an IT security manager gets the call, the rest of the staff is left to pick up the pieces. By Mathias Thurman

SECURITY MANAGER'S JOURNAL

AS IF THE EVERYDAY stress of my information security job were not enough, our department was hit with a bombshell. I'm in the U.S. Air Force Reserve, and my unit activated me. I've been out of the office for a couple of weeks now, and I'm attempting to contribute at work as best I can using my laptop and cell phone.

I got the call on a Thursday and had to report to the base the next day to sign in. Fortunately, I live near the base, so I'm able to return home on the weekends. I received word just prior to the war that I was going to be activated, so I was able to give my boss and security team advance warning. They weren't happy, but they were supportive and seemed more concerned that I return home safely than that I deal with unfinished business before my departure.

By law, my company must let me participate in the Reserve and must hold my position for me until I return. Although companies are required to hold reservists' jobs, they aren't required to pay them while they're gone.

Fortunately, my company will continue to pay me for the first six months of activation. That's a pretty good deal, since the difference between military and civilian pay is steep. (For some of my peers, the pay difference has been devastating.) Hopefully, I'll be released before the full six months are up.

In preparing for my departure, I transferred as many of my duties as possible to the staff. Right now, my major projects include deploying a wireless LAN, centralizing Unix authentication, performing application assessments and attending architecture review meetings for current and proposed applications. My other duties include things like documenting policy, procedures and standards; conducting investigations; and handling the administration of some critical security applications. I compiled a list of all of these tasks and approached my staffers to see who wanted to take over what. Although everyone is already stretched thin, they all pitched in and relieved me of the critical duties that I can't perform remotely. For now, I'm still available by cell phone and e-mail when questions or issues arise.

Remote Mode

As a full-time telecommuter, I'm using my company's Cisco virtual private network (VPN) concentrators for LAN access. Although the performance isn't as fast as it would be if I were at my desk, it has been sufficient to allow me to get work done when I'm off duty from my new day job. My department also has a weekly staff meeting, which I have attended via teleconference.

"Between the VPN, teleconferencing and additional telephone communication, I have managed to still be somewhat effective."

Between the VPN, teleconferencing and additional telephone communication, I have managed to still be somewhat effective. But there's a limit to what I can do. If I'm deployed to the Middle East, Internet access may not be available for my civilian work. And even if I do have access, the performance might degrade. Also, many military firewalls block VPN traffic to IP addresses that don't belong to the .mil domain name. So I'm preparing for the worst.

This week, I moved temporarily to another base in the U.S. that, fortunately, provides high-speed Internet access. So I used the VPN connection to access my company's newly installed WLAN management tool, the AirWave Management Platform (AMP), which we just purchased from San Mateo, Calif.-based AirWave Wireless Inc. Not only was I able to check on the status of the dozens of access points (AP) located throughout the corporate campus, but I also completed a rogue AP detection scan.

AMP uses two methods for rogue detection. The wireless detection mode works by switching some of our APs into promiscuous mode. We primarily use Cisco AP 1200s, but we have some units from 3e Technologies International Inc. in Rockville, Md., spread across our campus that we use exclusively for wireless AP detection.

The second rogue AP detection method involves a wireline AP scan. With this feature, the AMP system initiates a scan of the designated network and probes for signatures that resemble an AP. The AMP interrogates an IP address and port and can determine the type of AP by examining the return packets from the interrogated IP address.

This feature requires some additional configuration, because I have to ensure that I don't scan network addresses that aren't within my company. In addition, scans have to be coordinated so the security analysts don't panic as a result of what might look like a coordinated port-scan attack.

This time around, my scan didn't detect any rogue APs. Employees seem more cognizant of our AP detection capabilities and the ramifications of the discovery of a rogue AP (we confiscate the AP, and the employee faces disciplinary action). I now have set a schedule for scanning each of our networks on a regular basis. I've automated as much of this as possible, but it still requires coordination, and I'd rather control the execution of the scanning myself if I can.

In addition to participating in the management of the wireless network infrastructure, I hope to continue to perform a limited number of application assessments.

I remain hopeful that I will be released from my Reserve duties sometime soon so that I can return to full-time duties on my security team. ▶

WHAT DO YOU THINK?

This week's journal is written by a real security manager. "Mathias Thurman," whose name and employer have been disguised for obvious reasons. Contact him at mathias_thurman@yahoo.com, or join the discussion in our forum.

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SECURITY LOG

BRIEFS

XAware Upgrades Integration Server

XAware Inc. last week announced XA-Suite 3.0 for Java. The upgrade includes new features for streaming large XML documents, XML-to-XML mapping to simplify schema transformation, functionality for flexible data manipulation and mapping to business rules, and increased support for stored procedures with relational databases, according to the Colorado Springs-based company.

XA-Suite for Java 3.0 is available now and is priced from $5,000 to $50,000, depending on processor and connectivity requirements, the company said. It is also available for evaluation at www.xaware.com.

Nortel Introduces Layer 2 Switch

Nortel Networks Ltd. in Brampton, Ontario, last week introduced the BayStack 470-24T 10/10000 switch for Layer 2 connections in large companies. The switch is designed to lower complexity while adding quality-of-service functions. Nortel also announced new BayStack Operating System Switching Software that's designed to let users control a stack of BayStack devices as if they were a single system. Both products are scheduled to ship later this month. Pricing wasn't disclosed.

Bitstream Updates Wireless Browser

Bitstream Inc. in Cambridge, Mass., last week released a new version of Thunderhawk, its wireless Web browsing technology. Upgrades to the Enterprise Edition include features designed to improve and simplify installation, a new Linux installer and the ability to scale to 64 concurrent users, twice as many as previous versions were able to handle. Thunderhawk runs on the Pocket PC operating system. To download a free, 30-day trial version, visit www.bitstream.com.

PAUL A. STRASSMANN

Enterprise Software's End

SUPPLIERS of enterprise resource planning software are headed for a dead end. Systems integration from now on will be accomplished by networks that can make diverse systems interoperate without being forced into any one vendor's architecture.

Since the early 1990s, ERP vendors have insisted that companies will cut costs and improve productivity by investing in tightly integrated end-to-end ERP. These systems promise to automate business processes into an all-embracing architecture that dictates integration by means of an all-encompassing data warehouse. Accordingly, the goals of ERP could be achieved best by using software from one supplier.

The alternative — integrating a multiplicity of applications offered by admittedly superior yet specialized suppliers — was scoffed at as requiring middleware tools and time-consuming integration efforts. Extensive testing would be required as changes occurred. Undesirable translation logic would delay transactions, and performance would suffer.

Preintegrated software packages were the choice of many organizations seeking simplification in information processing and escape from the chaos of software proliferation.

Billions of dollars have been invested in launching organizations on a march toward synchronization through centralization. In just about every case I have examined, the driver has always been the finance establishment. They welcomed the opportunity to consolidate financial systems. The real agenda was to reassert control over the mess left by the rapid succession of failed CIOs.

The reality of ERP turned ont to be different than claimed. Just about every ERP system would be, in due course, either aborted or truncated when bumped up against the realities of enterprisewide systems integration. Contrary to claims that ERP provides easy-to-use, off-the-shelf solutions, the truth is that forced conversions from "legacy" systems are horrendously expensive and traumatic for the people who work with them. Many of these legacy applications could have been modernized at a fraction of the conversion cost by updating their data formats and standardizing on communications.

And few ERP systems have ever been completed as originally proposed. Smart operators never let go of systems that gave them answers they needed. Slipping schedules, budget overruns and user revolts forced firms to purchase supplementary solutions from a variety of small suppliers. Increasingly, users had to divert efforts from their vendor-provided standard applications to fixes and overlays that thwarted hoped-for systems integration.

Why do I now pronounce the ERP era as coming to an end? The answer is Web-based services that can deliver integration of dissimilar systems. Web services make it possible for corporations to plug into best-of-breed suppliers for rapid acquisition of innovative applications. Web services enable pilot tests that can verify performance before the company commits to implementation. They offer a superior architecture for enterprisewide integration of diverse, distributed and refurbished "legacy" applications that can remain in place until gracefully upgraded or retired. Web services promise a way to redoce huge development budgets. Web services avoid the shock of forced insertions commonly associated with all ERP ventures because they can be trickled into the workplace as the workforce is ready to absorb changes. Web services smooth the migration from hard-to-manage (and insecure) client/server environments to outsourced network service providers that offer the protection of experienced security staffs.

Web services accept diversity in applications instead of a single application architecture dominated by one supplier. They allow integration through network message sharing (in vendor-independent universal standard formats such as XML) instead of forcing every data element into a monolithic data repository.

Rapid replacement of failed applications is a benefit of Web services as is tactical outsourcing as an alternative to emigrating most of a company's IT to a contractor from where it can hardly ever be repatriated and never reconstituted. Web services make it possible to unburden the CIO of an organization from housekeeping and allow him to make IT a source of competitive advantage. Through loose coupling of services, the Web environment is more suited to the prevailing conditions where mergers, acquisitions and supplier and customer collaboration call for interapplication interoperability in a matter of days instead of years, as currently dictated by ERP initiatives.

Why then is the adoption of Web services so slow? Organizations can shift to Web service-based integration only after they restructure the way IT is managed and shift attention from computing to communications. They must also accept a move away from ownership of the means of computing and be willing to purchase most of their transactions as a service. I will write more about such transformations next month.

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MANAGEMENT

Squandered Opportunity
Companies invested heavily in IT asset management tools prior to Y2k, but they have largely failed to make long-term improvements. Industry experts offer tips for picking up the pieces. **Page 42**

Get Over Yourself
The pervasiveness of IT may be making it strategically irrelevant, according to *Harvard Business Review* editor Nicholas G. Carr, who says, "IT management should, frankly, become boring." **Page 44**

What You Measure Is What You Get
Forget descriptions like "world-class support." Contracts must include clearly defined metrics if supplier performance is to be measured fairly, writes columnist Bart Perkins. **Page 46**

TARNISHED IMAGE

DAVID HOLLENBACH

Budget overruns, project failures and lingering resentment over the millions spent on Y2k are to blame for IT's credibility crisis.

By Gary H. Anthes and Thomas Hoffman

IT WAS BUDGET TIME at Allied Building Products Corp., and the CEO wanted to know how the company could increase sales and profits in the coming year. "How much money do you need?" he asked his senior managers. "How many people do you need?"

"I said, 'Whatever extra dollars you would give to me, give to Jamie,' " recalls Brian Reilly, chief financial officer at Allied. "I get a better return out of money spent in Jamie's world than in mine."

Jamie Kutzer is CIO at the East Rutherford, N.J.-based company, where the CFO's extraordinary generosity with his budget is testimony to the extraordinary reputation of IT there.

Sadly, that type of relationship between IT managers and business managers is uncommon. Budget overruns and return on investment underruns have plagued IT and tarnished its reputation for decades. IT's performance has been poor in completing projects on time and within budget.

And it has grown worse during the past few years, according to research conducted by The Hackett Group in Atlanta, which regularly benchmarks the performance of nearly 2,000 companies, including 97% of the Dow Jones Industrial companies and 81% of the Fortune 100. According to Hackett, average-performing companies reported an IT project completion rate of 67% in 2002, down from 72% in 1999. The decline is more striking for the completion of one-year IT projects, which dropped from 58% in 1999 to 51% in 2002.

The Y2k nonevent, the dot-com bomb and disappointment over the cost and performance of complex systems have diminished the stature of some IT shops. Many IT leaders acknowledge that there's a credibility problem in IT. At *Computerworld*'s Premier 100 IT Leaders conference in February, 45% of 135 survey respondents said that IT had an image problem, which they attributed mostly to IT being too slow and too expensive.

IT is a "joke" in many boardrooms, says Joe Noga, a partner at Tatum CFO Partners LLP, an Atlanta-based CFO placement company. "What I hear is, 'Holy Christmas, they told me it was only going to cost 1% of sales, and it's 4%.' Or, 'They told me this thing was going to be installed and working in 18 months, and here we are 30 months into it, and we don't have the first part working,' " Noga says. And the explanations from IT managers often aren't helpful or particularly clear, he says.

Some IT executives acknowledge that IT faces cyclical reputation and credibility problems. For example, they point to the massive amount of money and labor thrown at the year 2000

problem. Total U.S. spending on Y2k from 1997 to 2000 was $125.9 billion, Meta Group Inc. estimates.

Although many industry experts and CIOs say the paucity of problems that occurred after the date change was a result of the effort put in by IT departments, some board-level executives say they think the problem was hyped and, thus, overfunded.

"I believe that credibility has been damaged and is being justifiably questioned," says Jerry McElhatton, president of global technology and operations at MasterCard International Inc. in Purchase, N.Y. One reason, he says, is that systems are much more complex than they were 20 years ago. "These enterprise systems are massive, and they require significant infrastructure changes," he says. "It's a huge undertaking, and people just miscalculate and underestimate what it takes to get these [projects] completed."

Many companies lack the capital to invest in modernizing IT, and IT has a history of not delivering ROI on such investments. These problems "test CIO credibility in some companies," says Robert A. Kotch, president of SIM Associates Inc., an IT consulting firm in Purdys, N.Y. Others point to CIOs who persuaded management to spend lavishly during the dot-com era on e-commerce initiatives that never paid off.

Susan Unger, CIO at Daimler-Chrysler AG, says that even during the height of the e-commerce boom, the automaker invested only in IT projects that were expected to deliver sizable returns. "We didn't get a huge increase in our IT budget then, so we haven't experienced a big decrease to our budget recently," she says.

For Unger, credibility depends on how CIOs have been perceived by senior management and what they have accomplished during their tenure. "If they had great credibility to begin with, they should be all right today," says Unger. "If they didn't, they probably lost it well before the dot-com era."

Chivalry Isn't Dead

Allied Building Products' IT shop wins credibility among business unit managers with a can-do spirit tempered with realism. As CFO Reilly says of CIO Kutzer: "Jamie's attitude is, 'You call me, and I'll get you the answer,' rather than 'I'll send you a report, and you run the business the best you can.' The gentleman before him promised too much, too fast, or he just said, 'You're not going to get it.'"

Not overpromising is important, Kutzer says. "Just last week, I walked into somebody's office and said, 'I'm here to manage your expectations.'" he says. Kutzer explained to the supply manager why the distribution software to be installed at a branch office was likely to be troublesome for the first three weeks. By doing so, Kutzer says he was able to help the manager set his hopes realistically.

Throwing cold water on user expectations is the right thing to do sometimes, but it can't stop there, Reilly says. "We'll go to Jamie and say, 'Here's what I'm looking for. How long will it take you?' And he says, 'How about if you did it this way instead?' He's sort of re-engineering the question." Kutzer has a strong background in business operations and distribution that helps his credibility, Reilly says.

But not everyone believes IT has a credibility problem. "I've seen a noticeable improvement in the reputation of IT and IT leaders in the past few years," says Linda Roubinek, an information systems officer at Nationwide Mutual Insurance Co. in Columbus, Ohio. "IT has become more of a core competency in business, and business leaders are starting to see technology as an enabler to delivering business plans."

Roubinek outlines several things Nationwide is doing to make IT both effective and appreciated. For example, she says, the CIO introduced a "sponsorship model" by which IT and business units are joined at the hip before a project starts. "Funding is agreed upon between the systems and business partners, and they go together to our corporate leadership for the money," she says. "They collaboratively work out what the ROI is and the goals of the project before requesting funding."

Every six months, Roubinek says, the IT and business partners take a fresh look at each project, recompute the expected ROI and request funding for the next six months. Risk mitigation plans are updated at that time. Any project heading south could get killed at one of these reviews. "We have developed the managerial courage to stop a project when we feel it's not meeting our original expectations," she says.

Corporate Systems Vice President Damien Bean's strategy for success at Hilton Hotels Corp. in Beverly Hills, Calif., can be summed up in one word:

Continued on page 40

If you believe IT's credibility has decreased, what are you doing to turn it around?

Getting business units more involved in planning and decision-making	17.4%
Improving communications with the CEO and other business unit heads	17.2%
Better prioritizing of key projects	14.6%
Evangelizing the value of IT	12.1%
Putting a greater focus on short-term ROI	10.4%
Establishing customer liaison teams	9.3%
Doing more cost-cutting	6%
Changing the approach and/or structure of the IT organization	1.6%

SOURCE: Survey of 135 attendees at *Computerworld*'s Premier 100 IT Leaders conference in February. Multiple responses allowed; 431 total responses

THE BOSS MATTERS

ALL TOO OFTEN, a company's top executive sees IT only as a tool.

For that reason, the CIO should report to the CEO, says Joe Noga, a partner at Tatum CFO Partners. "When IT grows up under a CFO, it is not viewed as an equal partner," Noga says.

Tim Stanley, CIO at Harrah's Entertainment Inc. in Las Vegas, reports to the chief operating officer.

"I have reported to CFOs in the past, and I don't much care for it," he says. "CFOs are very financially savvy. But being directly linked to the chief operating officer puts you right in the thick of business needs, desires and impacts. It's less of a cost equation and more of a business-value driver equation."

Of course, it doesn't hurt for IT to hit a grand slam, Stanley adds. The casino company's Total Rewards loyalty program is "a key driver of our 17 consecutive quarters of same-store sales growth," he says. The program and everything under it – such as modeling to predict customer behavior – is all IT-driven and for the past five years has produced better than 60% ROI, he says.

Despite periodic setbacks, there is some evidence IT may be increasing in stature. The Hackett Group last year published a survey showing that the percentage of companies with CIOs increased from 65% in 1999 to 82% in 2002. In 2003, more than a third of CIOs will report to CEOs (see chart).

Dennis Callahan, CIO at The Guardian Life Insurance Company of America in New York, reports to the CEO, and that arrangement lets him be seen as a business leader, not just as someone who keeps the e-mail server up, he says.

"One of the highest compliments paid to me by our CEO is that he doesn't think of me as a technical guy, he thinks of me as a real businessman who happens to know a lot about technology," he says.

Callahan, who joined Guardian in 2000, says the previous IT regime had "undershot expectations and overshot costs, and that led to a level of dissatisfaction with IT." To turn that around, Callahan says he pushed IT into a "rapid response, client-service orientation, starting with me, down."

He recalls the result: "The word got out – we are doing something new, we are moving fast, we are service-oriented, and the business heads and I partner top-down. The typical reaction from them was, 'Oh, I wish you were here five years ago.'"

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Continued from page 38

discipline. "We run IT like a business," he says. "The entire IT budget — every last cent — is funded out of the business side, and we charge back. We absolutely hit our budgets. We are very disciplined, and we deliver what we promise."

Bean puts the issue of IT's reputation into perspective: "I don't think IT executives are suffering a credibility gap more than any other senior function." He says if IT deserves a hit for its role in the excesses of the late 1990s, financial executives deserve it even more.

One way to elevate the stature of IT inside a company may be to outsource the commodity functions and retain the strategic ones. Owens & Minor Inc., a Richmond, Va.-based medical supplies distributor, has outsourced day-to-day IT development and operations to Perot Systems Corp. What remains is a small CIO office. Populated by a dozen people who act as links with the business units, the office "steers IT in the direction we need to go," says Don Stoller, director of information management. Stoller says Perot Systems gives him more flexibility to get the right skills for projects. "I don't know if we could have maintained the credibility, and the delivery of projects, without outsourcing," he says.

So while IT remains in the doghouse at many companies, IT managers elsewhere have employed a variety of strategies to win respect. The most successful ones say there is just no substitute for quality work delivered on time and on budget. ◗

LOOKING IN THE MIRROR

See how IT leaders responded to *Computerworld*'s February credibility survey

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First-Class Upgrade

PAUL A. STRASSMANN, an IT management consultant and *Computerworld* columnist who has served as the CIO at several large companies and federal agencies, says there are three kinds of CIOs, and if you want to be well respected, you should strive for the top category.

The "technology CIO" is on the lowest rung of the ladder and controls 3% or less of the company's total budget – basically direct spending for IT people and gear, he says. Next comes the "information resources CIO," who controls not only technology spending but also spending on information resources generally, perhaps 30% of the budget. At the top sits the "information strategy CIO," who ultimately has some influence over 100% of the budget.

"When you are a technology CIO everybody hates you, because when the e-mail goes down, it's your fault," Strassmann explains. "If you want to be appreciated, you have to get an upgrade."

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SINGING YOUR OWN PRAISES

SUFFERING FROM A TARNISHED reputation in IT? You may want to step up your sales efforts with a marketing program that helps reinforce the value that IT delivers.

IT executives at companies that have enacted such programs – including The MONY Group Inc., CBS and Baxter International Inc. – point to real benefits like financial gains and image makeovers.

Two years ago, MONY restructured itself by creating separate and dedicated IT groups, IT budgets and IT relationship manager positions to support each of its business units. That's when the IT department's marketing efforts began in earnest, says E.P. Rogers, senior vice president and CIO at the New York-based company.

The reason: MONY's newly organized business units were also given the OK to go around corporate IT and collect bids for technology projects from third-party vendors. If the best price and skills came from the corporate IT group, so much the better. If not, business units were free to hire from outside.

"We were always focused on our customers, and we'd always gotten high marks" from end users on an annual IT report card, Rogers says. "But when the [outside services rule] came down two years ago, we had to market. If we didn't have the right approach or culture established, we'd lose customers and have to let go of people."

Since then, MONY's IT group has taken steps to validate and better communicate its value to users. These steps include benchmarking the costs of developing applications, running its data centers and other IT support functions against external competitors such as IBM, says Rogers.

The IT group has also published a products and services brochure for business units to evaluate the costs and breadth of the IT group's offerings, including hourly Web services programmer rates and data center support costs.

MONY's IT group has been in head-to-head competition with outside providers for IT projects five times and hasn't lost one yet.

This includes a recent request for proposals by the company's annuities division to install a new administration system from Malvern, Pa.-based AdminServer Inc. One third-party services firm "aggressively" pursued the deal, but MONY's IT group demonstrated that it could install the system for $1 million less than the competitor's asking price, says Rogers.

The internal IT group was able to meet systems integration and design needs in a "much more cost-effective" approach than other companies that bid on the project, says Carol Sullivan, vice president and CFO of MONY's annuities division. The implementation began in March and is expected to continue throughout 2003, she says.

Before the restructuring, IT "was one cost center within a corporate entity," says Sullivan. Now, she says, the IT department is viewed as a partner, and both parties have a stake in reducing IT costs, such as CPU use and storage requirements. "It's relevant now that we're paying the bills," Sullivan adds.

Late last year, CBS, a division of Viacom International Inc., launched an IT transformation program that includes an IT marketing and communications practice. The marketing piece is aimed at helping the IT department better align itself with the business units it supports, including the CBS television network, 30 Viacom TV stations across the U.S., 183 radio stations run by Infinity Broadcasting Corp., and Viacom Outdoors, a billboard and transit advertising service.

"The business had changed quite a bit over the years and [the IT organization] hadn't," says Julie Kapsch, vice president of strategic services for CBS IT in New York. "We transformed ourselves in order to be better aligned with the business and to help us execute against an aggressive [business] agenda."

Kapsch says managers from CBS IT met regularly with business unit leaders during the yearlong project to discuss the types of products and services they were receiving and the strategic direction for each business unit before developing a support plan for each group.

Then, the IT group did a skills assessment of each of its 175 staffers and evaluated all of its processes – from planning to project execution and support – to come up with an operating model to meet the needs of the business. "We didn't want to eliminate any head count, but we did want to better utilize our resources," Kapsch says.

One of the biggest challenges for CBS IT since the reorganization has been trying to apply best practices to its own environment. "Even before the reorganization, we've been trying to run IT more like a business and communicate our successes in business terms, such as risk management and yield management," says Kapsch.

Even companies without formal IT public relations functions can take steps to burnish the image of IT. For example, MasterCard International annually surveys its external customers (member banks). It also surveys internal users after every project.

"We ask them did our people understand their requests, did they perform on schedule, did they perform on budget and so on," says Jerry McElhatton, president of global technology and operations at MasterCard. The company's IT satisfaction rating is 98% overall, he says. Its "top-box rating," the percentage of users who give IT the very highest mark, is 75%, he adds.

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INTERNAL MARKETING

The do's and don'ts of marketing IT in house
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Continued from page 38

discipline. "We run IT like a business," he says. "The entire IT budget — every last cent — is funded out of the business side, and we charge back. We absolutely hit our budgets. We are very disciplined, and we deliver what we promise."

Bean puts the issue of IT's reputation into perspective: "I don't think IT executives are suffering a credibility gap more than any other senior function." He says if IT deserves a hit for its role in the excesses of the late 1990s, financial executives deserve it even more.

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Squandered Opportunity

Companies invested heavily in IT asset management tools prior to Y2k but have largely failed to make long-term improvements.

By Thomas Hoffman

FLASH BACK to the late 1990s. Companies were spending billions of dollars to prepare computer systems for the Y2k date rollover. One of the key IT investments many of them made was in asset-tracking tools that could help them ideotify all of their hardware and software and determine which systems required modifications.

At the time, pundits and IT managers widely believed that the money and labor being pumped into Y2k would lead to more mature asset management practices beyond Jan. 1, 2000 (see "Y2k's Fallout of Good Fortune," QuickLink a3140). But that scenario didn't play out, at least oot oo any grand scale, according to IT industry executives, managers and analysts who track the asset management market closely.

"Companies squandered a lot of opportunities" by failing to make additional investments in their asset management tools and processes, says Frances O'Brien, an analyst at Gartner Inc. in Stamford, Conn.

Generally speaking, companies invested a lot of money and effort to get a more detailed view of the bardware and software in their IT portfolios, says O'Brien. "But they didn't take asset management further," such as using it to better manage IT contracts or to measure the interrelationships among systems more effectively, she adds (see story at right).

COUNTING COSTS
See some of the expenses of launching an asset program
QuickLink 38001
www.computerworld.com

That's true in part because many companies were focused on attacking the Y2k problem as cheaply and efficiently as possible and paid scant attentioo to refining their asset management processes, says Phil Davis, a vice president at Layton Technology Inc., a Tampa, Fla.-based firm that provided IT auditing services to companies in the late 1990s and now sells a PC auditing tool called AuditWizard.

Consultant Pat Cicala estimates that more than half of all corporate asset management programs in the U.S. have done little more than gather dust since Jan. 1, 2000. Cicala, presideot and CEO of Cicala & Associates LLC in Hoboken, N.J., says most companies have failed to follow up their Y2k inventory efforts with the creation of databases to track hardware and software licenses and other cootract details on an ongoing basis.

Indeed, during Y2k preparations, many companies focused on tracking their existing hardware and software systems but paid little attentioo to managing tbem, says Kevin Roche, general manager of Getronics North America, a Billerica, Mass.-based division of Getrooics NV, an Amsterdam-based IT consulting company. The minority of compaoies that have continued to develop their asset managemeot practices are using tools, people and processes to track hardware and software licenses, IT support costs and system utilization and to determine when an IT asset "has reached the end of its life," says Roche.

Post-Y2k Priorities

Y2k also had a whiplash effect on asset management practices. Heavy spending on Y2k-readiness led many firms to postpone e-business, resource management and other IT projects. Once that pent-up demand was unleasbed at the turn of the century, investments and enhancemeots to asset management initiatives were pushed to the back burner at many companies, says John Hillmer, director of technology services at Northwestern Mutual Life Iosurance Co. in Milwaukee.

Now, with a weak economy, IT budgets have been slashed and IT departments have been struggling to reduce costs wherever possible. Asset management has been among the projects to take a hit or be pushed to the back of the line. "Those organizations that are good at asset management are in the catbird seat," says O'Brien. "They can see how their IT investments are performing, and they have an easier time of obtaining funding" for new projects.

"It's a chicken-and-egg thing," says Cicala. If companies had funded and executed their asset management programs effectively over the past few years, "they would have generated the cost savings to pay for t0 other projects," she says.

Picking Up the Pieces

Most companies have generally underinvested in asset management since Y2k. Still, there are steps IT managers can take to improve. Industry experts offer the following advice:

- If your company has an asset management tool in place, see if the license is up to date and determine whether it's capable of supporting your current needs.
- If funding is a problem, start by tackling one area that can quickly deliver identifiable returns, such as auditing vendor invoices – even if they have to be counted manually.
- Get the CFO involved. CFOs understand and appreciate the importance of tracking and managing assets effectively.
- Don't look at asset management tools as a silver bullet, which is a mistake many companies make. People, processes and tools have to be integrated to make asset management programs succeed.

Beyond Covering Your Assets

IT departments that have managed to stay current with their asset management programs since Y2k are now focusing on configuration management and on making sure that they're meeting more stringent software-license compliance guidelines.

"We're trying to take asset management to the next level, beyond tracking and inventorying the costs and service-level agreements for individual assets," says John Hillmer, director of technology services at Northwestern Mutual Life Insurance. Hillmer and his IT group are using asset management tools and techniques to determine how a new application will interface with other software systems the company uses "and the impact it can have on other technologies that are closely integrated," he says.

Meanwhile, Microsoft Corp. and industry organizations such as the Business Software Alliance "are coming down hard" on software license compliance – a trend that's helping to drive a resurgence in asset management practices, says Phil Davis, a vice president at Layton Technology.

"The big guys," like Microsoft and Oracle Corp., are conducting software audits with customers more frequently, "and you have to show what you have in place," says Werner Knoblich, vice president of customer solutions at MRO Software in McLean, Va.

The Mason City School District in Ohio is using a systems management package called LANDesk from Clearwater, Fla.-based Enterprise Management Solutions Inc. to help roll out new software to its 2,200 Dell PCs and monitor all of its software licenses from a central location.

LANDesk, which costs Mason City about $13,000 annually in licenses, has helped the school district's IT department transition from supporting 250 end users with one technician to supporting 500 users, says Dave Hickey, the group's CIO.

Other companies are using asset management to cut costs. For instance, Mike Emmerling, a senior product manager at Getronics, points to a pharmaceuticals company that was having trouble returning leased equipment on time. Its use of asset management tools and processes saved $150,000 in lease cost overruns, he says.

– *Thomas Hoffman*

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The pervasiveness of IT may be making it strategically irrelevant.

Get Over Yourself

Information technology has become a commodity. All that's left to do is mitigate risks and control costs. So states **NICHOLAS G. CARR** *in this month's* Harvard Business Review. *Carr argues that IT, like railroads, electricity and other infrastructural revolutions that came before, has become so pervasive that companies can't live without it but that it now offers them little strategic advantage. Carr, HBR's editor at large, told Kathleen Melymuka why he thinks "IT management should, frankly, become boring."*

Why is the strategic value of IT diminishing? For any resource to have strategic value, it has to allow companies to use it in a distinctive way. As information technology becomes more powerful and ubiquitous, it is increasingly a shared resource that everyone has access to. As a result, it's getting harder and harder to use IT to gain any kind of edge over competitors.

Does this apply to all kinds of IT, or just to infrastructure? I'm defining IT as the processing, storage and transmission of data, so I'm talking quite broadly. All of that is actually becoming part of the general business infrastructure, just as the rail system became part of the infrastructure in the 1800s and the electric power grid became part of the infrastructure in the early 1900s.

Are you saying, for example, that businesses have already derived most of the value they can get from the Internet? Most of the strategic value. Companies are going to continue to use the Internet to increase productivity, but that's going to happen at the industry level, not at the level of individual companies. As a means of differentiation, I think we're already past the peak and on the downside.

What are the characteristics of IT that guarantee this rapid commoditization you write about? First, IT is essentially a transport mechanism. It carries digital information in the same way power grids carry electricity. That's much more valuable when it's shared than when it's used in isolation, so everyone quickly moves to shared systems. Second, the almost infinite scalability of many IT functions, combined with the rush to technical standardization, means there's no economic benefit to having proprietary applications.

No one writes their own e-mail or word-processing applications, and that approach is quickly moving to supply chain management and CRM. Generic systems are efficient but don't offer advantages over competitors because we're all moving to the same systems. With the arrival of the Internet, we've got the perfect delivery channel for generic applications. As we move to Web services, where we can purchase key applications just like we buy electricity, that will push us further toward the homogenization of IT capability.

Isn't it possible that there will be another "big thing" in IT that's still unforeseen? That's possible, but we're already starting to see that the capabilities of the IT infrastructure are greater than the needs that businesses have. It's always possible something out of the blue will change everything, but it's hard to imagine that happening the way you could five or 10 years ago. Also, even if something like that happens, it will probably come out of the vendor community, not the user community. All companies will be able to buy the capability, so no company will get an advantage.

What do the previous infrastructure build-outs – like railroads and electricity – tell us about the ratio of risks to advantages in the current state of IT? In the early stages of the build-out, companies can get proprietary advantages because access remains limited due to physical limitations or patents or high cost. So companies begin to see them as ways to build advantage. But the build-out happens so fast that the window to gain advantage is open only for a short time. Then the technology becomes a cost of doing business that all pay, and nobody gets advantage.

When things begin to tip that way, the risk involved in using that technology starts to outweigh the advantage. For example, nobody gets strategic advantage from electricity, but if you lose access, that can devastate your business. We're seeing the same thing with IT. The risks are beginning to weigh much more heavily than possible benefits, so companies need a more defensive and less offensive posture toward IT investments.

Are you saying companies should be more concerned with IT risk mitigation than with IT strategy? Exactly. I think IT security should be a much greater concern than it has been. I think the real competitive struggle in the use and management of IT is over cost. It's hard to use IT to gain a strategic advantage, but if you use it poorly, you can quickly put yourself at a cost disadvantage.

You talk about overspending as the biggest risk of all, but every IT leader I talk to bleeds ROI. If an IT project pays for itself and more, isn't that enough? I think the focus on ROI is exactly right. But it's important to make sure when you look at ROI that you're not assuming some competitive advantage that heightens payback. You have to really look at payoff in cost savings and operational efficiency. I think there's still a danger of managers getting excited about the potential for advantage and moving too quickly into new technology.

If it's getting harder to realize the benefits of IT, why is the cutting edge not the place to be? IT costs plummet extremely quickly. Companies should ask not only whether this investment is justified based on ROI calculations today, but whether payoff will be even greater if they wait six months or a year. An imperative for IT management is to go slowly — to follow rather than lead.

Should IT managers be looking for new careers? It depends on what kind of IT managers they are. Companies have increasingly bought into the assumption that IT is a strategic resource. As a result, they have brought in CIOs who are conceptual, strategic thinkers about IT. I think there's less of a need for those types of individuals.

But because expenditures will remain so high, there's enormous need for technically astute, hard-nosed business people who can really help companies to get the most out of IT spending. I think IT management will get less sexy but remain just as essential in another way. ▶

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BRIEFS

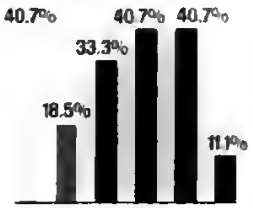
Large Companies Spend $10M on ERP

ERP projects are costing large companies approximately 1% of annual corporate revenues and taking an average of 20 months to implement, according to results of a recent Meta Group Inc. survey of more than 200 companies whose annual revenues exceed $1 billion. About 70% of ERP costs are for labor, Stamford, Conn.-based Meta found. ERP implementations also take an average of 27 months before companies realize benefits from them.

CSC Wins $80M Outsourcing Pact

Denmark's largest insurer, Tryg, has signed a five-year, $80 million outsourcing contract with Computer Sciences Corp. (CSC) in El Segundo, Calif. CSC will provide mainframe, midrange and desktop support as well as perform help desk and network infrastructure functions. CSC will replace Nordea-IT, the IT organization of Tryg's former owner, Nordea AB, a Stockholm-based financial company. CSC said it expects seven IT workers from Tryg and 70 IT workers from Nordea-IT to sign on as CSC employees.

Which project management tasks does your organization outsource?



BASE: 1,000 project professionals and senior-level executives at Global 2,000 companies

SOURCE: CENTER FOR BUSINESS PRACTICES, HAVERTOWN, PA., 2003 (MULTIPLE RESPONSES ALLOWED)

BART PERKINS

What You Measure Is What You Get

A WELL-WRITTEN IT services contract defines many client-specific requirements. But all too often, the metrics necessary to measure and meet those requirements are glossed over during contract negotiations.

Worse yet, service-level agreements are rarely enforced as work progresses. Instead, buyers usually don't bother to look at the metrics they have negotiated until somebody complains. This is like balancing your checkbook only after a check bounces.

Metrics need to be specific, actionable and designed tn ensure that the supplier meets the buyer's goals. Metrics that are highly specific but track the wrong things are useless. One example is a call center that measured the lengtb of calls. Because the company was really interested in providing a very high level nf service, a better measure would have been the percentage nf problems resolved on the first call. Buyers nften don't have sufficient experience defining appropriate metrics. Many contracts contain immeasurable and grandinse language such as "provide world-class support." Clearly defined metrics provide a baseline against which supplier performance can be fairly measured.

At contract time, many suppliers lack sufficient information about the customer's requirements to propose useful metrics. (In some cases, suppliers hope to get back price concessions by taking advantage of loosely worded metrics.) Challenge your supplier to share successful metrics from other customers.

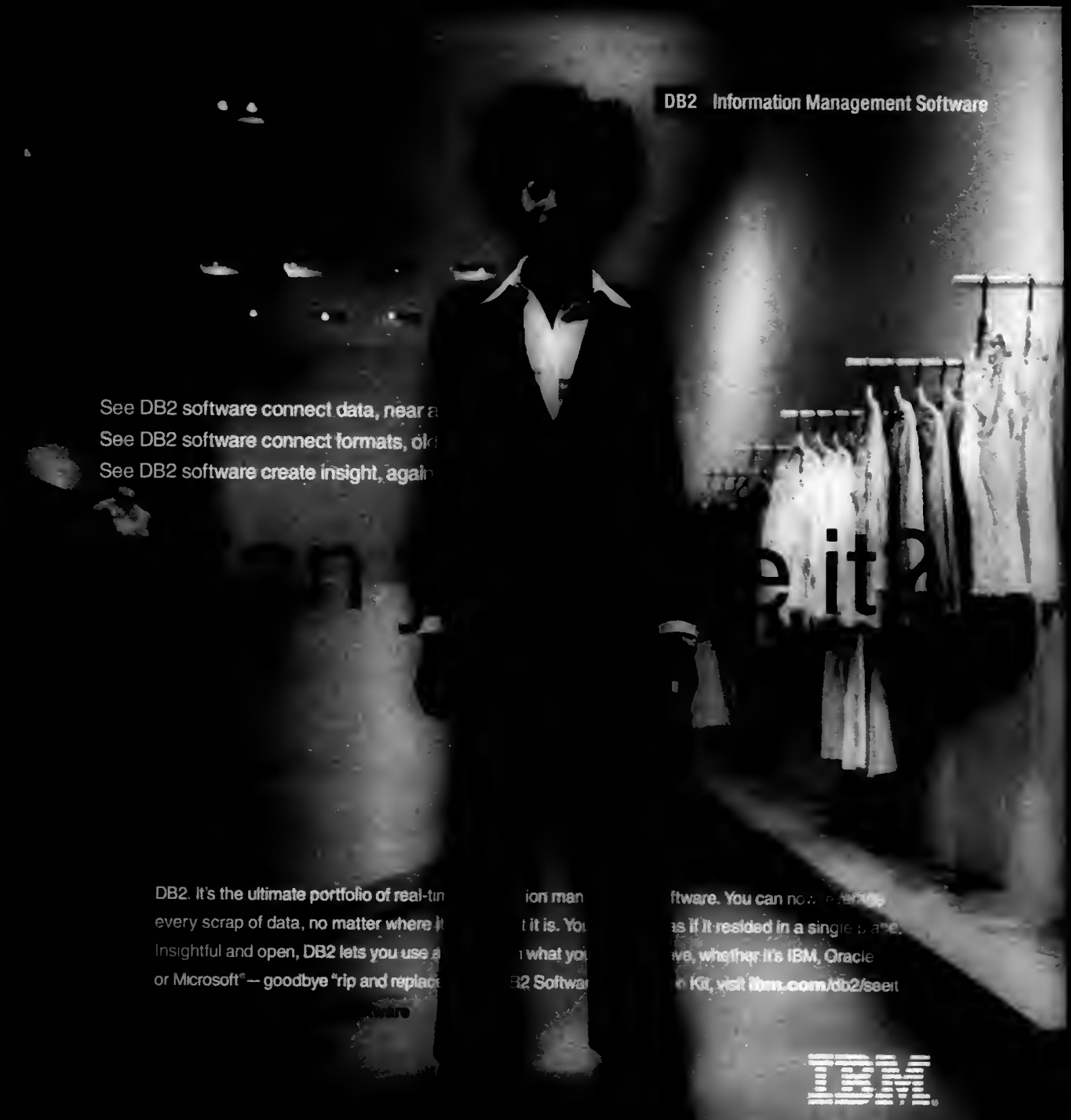
The buyer is ultimately responsible for the success nf any acquired product or service. Even when you outsource a function completely, it's still your responsibility to monitnr the provider effectively. Research best practices. Interview peers and industry watchers to find out what metrics are commonly used and which vendnrs are meeting them.

To get the most nut nf your supplier measurement program, you should do the following:

- Prioritize your goals. Most buyers are interested in a combination nf financial performance, service quality, operational excellence and the ability to meet future needs. Articulate and weight each goal before negotiating.
- Define metrics early. Metrics should be identified and negotiated as part nf the initial contract, preferably by the same individuals who will be responsible fnr them after the contract is signed. But it's never too late — even where contracts are already in place, negotiate metrics that will effectively measure success.
- Establish nperational metrics that support your goals. Appropriate metrics will vary by company and by type of product or service being acquired. Select metrics that will accurately assess progress, and design metrics to influence the behavior you want. For example, monitoring "unit cost" metrics motivates your supplier to drive those costs down — especially if there is a bonus for dning so.
- Grade performance. Use a multi-level indicator of success, e.g., letter grades. If a supplier realizes halfway through the month that a target will be missed, it may quit trying if evaluated strictly "pass/fail." With a letter grade, the supplier can still get a B for the month.
- Use value-based metrics. Poorly chosen metrics allow suppliers to meet their contractual service levels and still disappoint the buyer. For example, some suppliers specify the number nf people who will staff a function instead of specifying the expected output. Metrics such as response time per event and cost per service unit are inherently more useful.
- Use metrics that support your culture. Companies that normally operate based nn data and numerical analysis can easily work with an extensive set nf metrics. Companies that are based mnre nn passion and energy may lack the focus for more than a small number of metrics at first. Stay away from cnmplex measurement approaches until comfort increases.
- Define trade-offs. Prepare to pay mnre fnr higher levels nf service. And be fair — if you want to collect penalties for poor perfnrmance, also pay incentives fnr exceeding targets.
- Review performance regularly with the supplier. If the service you want is significantly better than the service you are getting, develop a service improvement plan with appropriate metrics and timetable. Service-level agreements form the basis fnr supplier governance and provide a solid foundation for clear communication. Metrics that are carefully specified and consistently reviewed can help manage expectations fairly and accurately. And they pay off — what you measure is what you get.

WANT OUR OPINION?

For more columns and links to our archives, go to www.computerworld.com/opinions



IT without borders:

Are you contemplating or have you outsourced part or all of your IT operations? Are you taking the on-shore or off-shore route? What, if any, obstacles do you see to offshore outsourcing. What benefits do you hope to reap?

We want to hear about your experiences so we and your peers can get a clear picture of where outsourcing stands in today's IT strategies.

We invite you to participate in the Computerworld and InterUnity Group survey on the Best Practices and Emerging trends in On-Shore and Off-Shore Outsourcing.

Receive a FREE report!

If you complete the entire survey, you will receive a complimentary report of the findings.
(All responses will remain confidential).

To participate in the survey, please visit:
http://websurveyor.net/wsb.dll/11829/Interunityoutsource.htm

Need more information? Please contact research@computerworld.com.

COMPUTERWORLD

Principal Software Engineer/ Developer to provide development expertise for relational databases designed to support web-based applications. Will work on various projects providing leadership in the design and development of database systems. Will provide the specifications, design programs (stored procedures, OOL scripts) and other necessary database elements for a successful program. Will be responsible for writing and supporting import and export programs using PERL in a UNIX environment. Will write stored procedures in Oracle (using PL/SQL) Sybase or SQL Server for SQL programming. Will apply working knowledge of CASE tools, UNIX and NT environments, and programming languages including Shell and PERL. Requires Bachelor's degree in Computer Science, Engineering, Mathematics, Physics, or Business and four (4) years experience in job offered OR four (4) years experience in database development. Candidate must also possess demonstrated expertise in database design and development using SQL, PL/SQL and Oracle XML, demonstrated expertise in application migration from Sybase to Oracle environments, and demonstrated expertise in automation of procedures using UNIX shell scripting. Salary $90,500/yr. Mon-Fri, 9:00AM-5:00PM. Submit two copies of resume to Case # 200116236 Labor Exchange Office, 19 Stanford St. 1st fl Boston, MA 02114. EOE. Applicants must be eligible to accept full-time employment in U.S.

Sr Consultant sought by NYC Computer Consulting firm to analyze user needs to dsgn, dvlp & implmt medium to large scale applics using technologies such as Lotus Notes/Domino, Lotus Script, Java, Java Script, Java Servlets, XML, XSL, XSLT, JSP, JDBC, HTML, DHTML, Oracle Win 2000/NT/95. Must have MS in Comp Sci or Engg, Info Systems Engg or related w/3 yrs relevant work exp. Send resume to Gemini Systems, HR #SCSD, 81 Broadway, Ste 925, NY, NY 10006

Software Engineer needed in Bank's J2EE Development Group. Requirements: B.S. expertise in all phases of software development life cycle and ability demonstrated on the job to design, develop, implement and test the technical components of n-tiered E-commerce applications using J2EE, Oracle, OOAD, and mainframe connectivity/communication skills. Competitive salary and benefits. Send resume to HR, Webster Bank, 10 Main Street, Bristol, CT 06010 or email Surcmas@websterbank.com. An Equal Opportunity Employer

Software Application Engineer: program, install, configure, setup, develop and debug web based Human Resource/ Payroll database applications. Interact with customers. Duties include utilizing SQL Server, Visual Interdev, Java Script, ASP platform and Ceridian payroll Education Required: Bachelors Degree in Computer Engineering and one year experience or equivalent. Send resumes to **iSarta Inc., 899 Fall River Ave., Seekonk, MA 02771** or fax **1 (508) 336-5894.**

Seeking qualified applicants for the following positions in Memphis/Collierville, TN: Senior Programmer Analyst. Formulate/define functional requirements and documentation based on accepted user criteria. Requirements: Bachelor's degree or equivalent in computer science, MIS, engineering or related field plus 5 years of experience in systems/applications development. Experience with Java, Unix and SQL programming also required. *Master's degree in appropriate field will offset 2 years of general experience. Submit resumes to Sibi George, FedEx Corporate Services, 1900 Summit Tower Blvd., Suite 1400, Orlando, FL 32810. EOE M/F/D/V*

SOFTWARE ENGINEER sought by company in Austin, TX which develops software for computer-assisted drug discovery. M.S. in Computer Science & exp. req'd. Respond by resume only to Mr. Bryan Koontz, D/Y, Optive Research, Inc., 7000 N. Mopac Expressway, 2nd Fl., Austin, TX 78731

Optimal Solutions Integration, Inc. has multiple openings for SAP and i2 Consultants. Software Analysts and System Analysts. Please send resume with salary history and requirements to Optimal Solutions Integration, 8445 Freeport Parkway #240, Irving, TX 75063. Open to Green Card holders or US Citizens

Mascon has mult openings avail for IT professionals and Senior Consultants. Duties will include but will not be limited to developing and designing S/W systems using various H/W, O/S, tools, software packages and languages, developing client server, mainframe, midrange, and/ or web applications. A degree is required. WE will accept foreign equiv. of the required educ. and/or its equiv. in edu. and experience. Competitive salaries offered. Must have experience/ or education in the IT field. Apply at: mascon-recruiting@mascon.com. Mascon, HR, 1699 E. Woodfield Rd., Schaumburg, IL 60173

SENIOR SYSTEMS ANALYST

Responsible for analysis, design and support of Materials Management functionality in the SAP R/3 environment including providing consultative services and implementing inventory management solutions; assisting IT Inventory Team Lead with rollout and production support of R3 MM module; assisting in the design development, implementation and support of Functional Specifications related to all aspects of the order to cash scope; performing systems maintenance, enhancement and production support; and providing training for functional business users as required. Position requires minimum of a Bachelor's degree in Information Technology or a related field and two (2) years experience in SAP R2 and/or R3 configuration and functionality with inventory management modules. Position full-time M-F. Salary $75,000/year. Job is located in Omaha, Nebraska.

Interested applicants may submit their resumes to www.conagrafoods.com, click on "careers" then "apply now". Note: You must type in the following code of C-CMIS255 in the box labeled "In what job are you interested". In order to apply for this position. Failure to correctly enter this information will result in non-consideration for the position.

SBI is looking for the following positions for its offices in Houston, TX, San Francisco, CA, Warren, NJ, Salt Lake City, UT and Portland, OR: Programmer Analysts, Technical Architects, Technical Consultants, Business Strategists, Systems Analysts, Software Engineers, Art Director, resumes by email or fax only to HR, SBI, 2825 East Cottonwood Parkway, Suite 480, Salt Lake City, UT 84121. careers@sbiandcompany.com; Fax (801) 733-3201

IT Project Ldr-Perform device spec h/w maint & install peripheral equip. Prep syst specs, setup & tech support of firmware programmers. Plan, design, build & mge lab test networks. LAN & WAN connections incldg IP satellite uplinks. Design & prog IT systs & applications using Microsoft BackOffice prods such as Microsoft Exchange, SQL Server, Visual Basic & Sun Solaris. Write & implement network security techs & procedures. Bach's deg in Comp Sci, Physics or Engrg reqd + 2 yrs exp in job or 2 yrs exp as Systems Analyst. Send resumes to: MECA/HR, 7625 Panasonic Way, San Diego, CA 92154. Attn: ITPL

Ease seeks S/W Engr for HQ office in Portland, OR. DESC: Impl optimized code across industrial & consumer oriented tech apps through dsgn & impl of sys level firmware & s/w apps util C/C++, assembly langs & var embedded & RTOS. REQ: BS in Engr, CS, Math, or Physics + 5 yrs exp dsgn & impl of sys level firmware & s/w apps util C/C++ & assembly langs to run on embedded & RTOS. Prem sal + benes. Pls reply to J Kinker, Job #ES-101, 9999 SW Wilshire Street, Suite 231, Portland, OR 97225.

Systems Analyst w/5 yrs exp or 5 yrs exp as Computer Eng. to coordinate changes to our UNIX computer databases. Job site in Darien, CT. Send resume to HR, Danzas AEI, 120 Tokeneke Rd., Darien, CT 06820.

ShellSoft seeks IT professionals (programmer/system analysts, software engineers), project engineers. Our minimum requirement is BS. Good skills using Oracle, SAP, SQL, Java, C/C++ preferred. Some position requires travel. Please send resume to: jobs@shellsoftinc.com. EOE.

Computer Professionals (programmer, system analyst, software engineer) wanted by Bralak Technologies. Candidates must have at least BS degree, IT experience in C/C++, Oracle, SQL, VB is a plus. Attractive wage with full benefits. Please send resumes to recruiter@bralak. EOE

Trading Floor Lead Specialist sought by NJ based Securities Dealer for San Francisco, CA office. Must possess Bachelor's degree or equivalent in Management Information Systems or directly related field and 1 year exp. in software/systems development, design and analysis including UNIX and PC systems. Respond to Human Resources Department #TJX-661MI, Knight Trading Group, 525 Washington Blvd., Jersey City, NJ 07310

Seeking qualified applicants for the position of Senior Software Engineer to perform analysis, design programming and modifications for software products and/or customer applications using Korn-Shell Scripting, PL/SQL, Perl, and JSP/ASP. Requires B.S. or equivalent in Computer Science or related discipline and five years of relevant experience. Experience must include data-warehousing in the healthcare industry. Submit resume to Melinda Morales, NDC Health, 2394 E. Camelback Rd., Phoenix, AZ 85016.

Western Union, a Division of First Data Corporation, a company headquartered in Greenwood Village, CO, seeks an Application Architect to work in Montvale, NJ to participate in application analysis, design and development of software for money transfer systems. Requires 2 years as a software engineer in the credit card processing industry, as well as working knowledge of money transfer systems. Unisys 1100/2200 platform, ASSEMBLER and COBOL. Respond by resume only to Norm Barnett, First Data Corporation, 12500 E. Belford Ave., Mail Stop M21B12, Englewood, CO 80112 and refer to job #3368KU

We need a Software Engineer to develop software to control auto engines, powertrain & fuel-injection systems. To design engine control algorithms in signal-diagram form & write programs in C/C++/Assembly to implement them into Siemens 8/16bit microcontrollers. Use Matlab, ASCET-SD, INCA, CANalyzer, Hitex/Hitop debuggers & PVCS tools. Job in Davenport, IA. Related Deg. & Exp. required. Send resume with Ref. ICG/PR/001/2003 to Nawroz Salam, ENTEGEE Inc., 150 Bear Hill Road, Waltham, MA 02451 or Email entegee.boston@entegee.com within 14 days.

Systems Analysts needed at client sites to analyze & eval systems; provide architecture for systems & interact w/client/teams to enable strategy using Oracle D/base & Oracle Apps, Discoverer, SQL, PL/SQL, Unix, XML, HTML, Sun Solaris, BAAN, SAP, Siebel (Tools & Appl), Power Designer. Apply to Global Consultants, 25 Airport Rd, Morristown, NJ 07960

Senior Systems Developer sought by Charlotte NC based Information Technology Consultants for Greensboro NC office Must posses Bachelor's degree or equivalent in Electrical Engineering or directly related field and 2 years exp in systems development/design and analysis including JAVA and Rational Rose Respond to Human Resources Department: J Connell, Premier Alliance Group 4521 Sharon Road Suite 300, Charlotte, NC 28211

A multinat'l software consulting co has multp openings for Business Development Managers Duties will include e thorough understanding of the IT industry Experience is a must. A degree is required or its foreign equiv or its equiv in edu/experience Apply at MASCON HR, 1699 E Woodfield Rd., Ste 200, Schaumburg, IL 60173 or e-mail at mascon-recruiting@msceonll.com

Denso Manufacturing is a subsidiary of Denso Corp in Japan It looks Electrical or System Engineers to design unique equipment for manufacturing process. Candidate must have BS in Electrical eng. with exp using Allen Bradley Contact Sandra-boland@denso-diam.com. EOE.

RW3 Technologies is a leading provider of CRM solutions for Consumer Packaged Goods industry It has opening for programmer/computer analyst Minimum requirement is BS with experience in Crystal, SQL, Apache Send resume to 1033 Lapoisada Ste 250, Austin, TX 78752

System Engineer Responsible for system administration for Windows operation, Linux, and AIX environment, troubleshooting, networking issues, software upgrades, implement/maintain all network, webserver, backup and disaster recovery documentation Req a min BSCS plus 3 yrs exp & familiarity with databases (SQL & MySQL) & exchange 2000 Send resume to Joseph Kong, Asia Pacific Groups, 1290-24th Ave, San Francisco, CA 94111 EOE

Manager, O&T to coordinate computerization of clients business operations. Apply integration and ERP skills to Operations Mgmt., accounting, payroll, taxes, check writing, cash register records, inventory mgmt., ordering of supplies, merchandise and equipment, supply chain management Evaluate existing hardware/software, computer networks and recommend upgrades. Supervise programmers, analysts other team members involved in project execution MS or MS degree or Engineering or Science + 2 yrs. exp. in job duties Apply to A-1 Consulting, 4278 Covington Highway, Decatur GA 30035 web proof of permanent work authorization

Mobile computing technology development company seeks a senior software engineer with 4yrs B.S. degree in science, software engineering, systems engineering or programmer analyst and 5 yrs relevant experience This job position requires high level of analytical and design skills to build integrated solutions. Would perform each task in the engineering lifecycle of building a software product including analysis, design coding, testing and maintenance of the application and manages the project The candidate will lead projects including reviewing and analyzing business needs and building the appropriate solution. Will provide internal application support by providing technical and consulting services for new business initiatives The candidate must demonstrate sound program logic and perform post implementation review to ensure all requirements have been met. The tasks would include working on application development that involve COM/DCOM distributed computing, client/server database, SQL server Internet Information Server programming and XML The candidate must be proficient in C/C++ and Java One particular solution is the conduit technology integration which would link the web with the PDA/phone device 40 hrs/wk-5p Sal $96000 Reports to VP, Engineering Qualified candidates send two copies of resume to: Case# 2002006636, Labor Exchange Office 19 Staniford Street, 1st floor Boston, MA 02114

Computer Software Engineer needed to work in all functional areas of project life cycle: conduct business analysis, application dvlpmt; ensure software processes/products conform to requirements, standards & procedures. Must have Master's degree. Send resume to: Global Resource Management, 250 Pinnacle Way, Norcross, GA 30071.

Junior Programmer (North Palm Beach, FL) Write and fix system software in PERL, HTML and JAVASCRIPT in a Unix Environment. Program Perl Modules/APIs utilizing ODBC/DBI utilities. Produce system documentation for new products Technical support for website and performance degradation Troubleshoot reservations systems including writing code. Utilize knowledge of Apache running Raven and Modperl. XML, Perl, Perl ODBC/DBI, HTML, Javascript, Window NT and Windows 2000, Unix, PVCS, Sabre and Pegasus Minimum of Bachelor's degree in Computer Information Systems, and 6-month experience in job offered or 6-month experience as a Technical Support Assistant. 40 hour/week; 9 a.m.-5:30 p.m., $46,000/year Please send two resumes to: Jean Wroblewski, President, WorldChoiceTravel.com, Inc., 11300 U.S. Highway 1, Suite 300, North Palm Beach, FL 33408

Software Engineering Project Manager to be responsible for leading the creation of Internet products for Company's website. Will also develop 401k website for clients and oversee the development & maintenance of the soon-to-be-created software systems that support the electronic channel group's web-based applications Will serve as technical lead on various project teams to cutting-on-all aspects of web development involving ASP, HTML, Java Script & software development in C++ Will work with engineers & designers to bring state-of-the-art products to market quickly using unique methods. Will conceive and design complex leading-edge internet applications using VC++ & 6.0, VB, 6.0, COM/DCOM, MTS, IIS, ASP, XML, DHTML and relational databases applying experience in web/internet architectures, object-oriented design & financial services Will also mentor junior development staff members Requires Bachelor's degree in Computer Science, Computer Engineering, Engineering, Mathematics or Physics and five (5) years experience in job offered OR five (5) years experience in developing web-based applications OR in the alternative, Master's degree in Computer Science, Computer Engineering, Engineering, Mathematics, or Physics and three (3) years experience in job offered OR three (3) years experience in developing web-based applications Candidate must also possess demonstrated expertise developing middleware applications using COM/DCOM, as well as demonstrated expertise developing and designing web applications in Visual C++ and XML using OO methodologies Salary $104,650/yr Mon-Fri, 9:00AM-5:00PM Submit two copies of resume to Case # 2001162235 Labor Exchange Office 19 Staniford St, 1st & Boston MA 02114 EOE Applicants must be eligible to accept full-time employment in U.S

NT SYSTEMS ADMINISTRATOR Will provide support for the Windows NT server environment. Will perform operating system and application software installations and upgrades, including patch releases as necessary Will perform hardware upgrades, maintenance, and system backups on a regular basis. Will maintain and update systems operating procedures. Will ensure system integrity by maintaining and updating anti-virus software. Will maintain internet/intranet infrastructure. Will deploy and maintain video conferencing capability Will respond to second tier requests through the helpdesk process Will lead projects as assigned with minimal supervision Requirements: B.S./B.A. (or equiv) in Computer Science or closely related field and two (2) years of experience in the job offered or two (2) years experience in the related occupation of System Administration or Programming Also, demonstrated expertise in using three of the following: Microsoft Backoffice Suite; TCP/IP; Citrix Server; McAfee Antivirus Suite In addition, demonstrated expertise working in a multi-vendor environment. Must be MCSE certified Offered salary is $48,000/year for full-time employment (min. 40 hours per week) and standard company benefits EEO Submit 2 resumes and respond to Case No. 2002 01345 Labor Exchange Office 19 Stanford Street, 1st Floor Boston, MA 02114

Systems Analyst w/int'l IT consultants, to work at various client sites in the U.S. and abroad Implmt, maintain & upgrade Oracle ERP s/ware pkgs Reqs: Bach in Comp Sci, Engineering, Business, Logistics, HR, or closely related field + 2 yrs exp w/Oracle applic or db's. Send resumes, refs, and salary requirements to Attn: Hr, IT Convergence, 150 E. Gilman St., Suite B2200, Madison, WI 53703.

Lead Applications Developer

Lead worker for development, maintenance and enhancement of web computer applications. Perform logical and physical database design. Manage assigned projects utilizing comprehensive project management practices. Must be able to design, develop and implement dynamic web applications. Perform project management and make assignments to team members. Responsible for content management, database development, application development, quality assurance R&D, site architecture and security and technical documentation. Bachelor's in Computer Science or MIS. Certified Cold Fusion developer experience with Microsoft NT, IIS, Java script, HTML, SQL, MS Office, Project and Outlook. 4 years experience as Lead Web Developer required. $52,998/year. Must have legal authority to work in the United States. Send resume to:

Madhavi Bhadbhade
Nebraska Workforce Development
P.O. Box 94600
Lincoln, NE 68509-4600

Please reference Job Order # SBAH5-MZGP6-14220 on your resume/cover letter

Software Engineer

Resp. for all tech., mgmt & implt throughout co. Implement new tech. to make company more efficient, develop, implt & maintain a contact management database, manage co.'s network incl. hardware & software troubleshooting, repairs, & software updates, administer Linux E-mail server & mailing lists, provide tech support & training, develop & support co.'s website. B.S. in Math or CS & able to use MS Windows 2000/NT/98/95, Linux, SQL, C/C++, Perl, MS Visual Basic, DHTML, ASP, JavaScript, Perlscript, VBscript, MS SQL Server 7.0/2000, TCP/IP, adm LAN/WAN, adm, Web-design & adm. E-mail systems adm. Must have certificates MS SQL Server 7 Programming, TCP/IP Administration, MS SQL Server 7 Administration, Internet Security. 40 & flexible 9-6. Send resume to Mr. Michael P. Brosterman, Chief Operating Officer, Pinnacle Health Group, 5687 Glenridge Dr., Ste. 200, Atlanta, GA 30328

Consultants

For its clients located all over the United States. Nethirelings.com, Inc. is accepting applications from experienced Consultants for the following positions:

- Network Systems Admin. Analyze, design network systems, data communication & network security systems in multi-platform environments, architect & develop enterprise network management systems & network operation centers. Bachelors degree in Electronics Telecommunications. Comp. Sci. and experience including Micromuse Netcool and HP Open View Products required
- Programmer Analyst: Develop applications for the embedded systems, real time devices, scanners, mobile devices, PDA's and Hand held PCS. Bachelors degree in Comp. Sci., MS/IS and experience including embedded systems, WAP and VC++ on WIN CE Platforms required
- Business Analyst: For financial and investment industry clients. Formulate Business Information Systems solutions in compliance with government regulations, align IT solutions with business initiatives and vice versa, render analyses for Business Process Outsourcing (BPO), provide process guidance at each step of the project. Bachelors degree in Computer Science, MIS/IS and experience including analyses of financial systems and e-Business systems. RUP and tools and knowledge of SEC, FDIC government regulations required.

Resumes with references, salary requirements & permanent employment authorization status to: Vish Subramanian, General Manager, Nethirelings.com Inc., 421 N. Wabasha St., Ste. 202, St. Paul, MN 55102

Sr. Info. Systems Specialist wanted for investigation, development and maintenance of complex software requirements for engineering and manufacturing operations, including reviewing and evaluating requests for changes in existing systems, determining modifications to meet new requirements and improving operation of existing ones, planning and developing new applications and major conversions to new equipment. 40 hrs/wk, 8 am-5 pm, $63,000/yr. requires Bachelor's degree in Computer Science or Electronics Engineering, and 5 yrs. exp. in job offered, or 5 yrs. related exp. as Systems Analyst, and exp. to include at least 2 yrs. in development and maintenance of software systems for automotive applications. Send resume to MDCD/ESA, P.O. Box 11170, Detroit, MI 48202-1170. Ref. No. 210475. Employer Paid Ad

Jr. Consultant sought by NYC Computer Consulting firm to analyze user needs, to dsgn, dvlp & implmt medium to large scale applics using technologies such as Lotus Notes & Domino, Lotus Script, HTML, DHTML, Java Script, ASP, VB, Global Knowledge Formula, IIS, MS Office/Projects/Visio. Must have MS in Comp Sci or Engg, Info Systems Engg or related w/1 yr of relevant work exp. Send resume to Genex Systems, HR RJCTM, 61 Broadway, Ste 925, NY, NY 10006.

Positions are available for Software Development Engineers I in Atlanta, Georgia with a technology solutions company. The company architects and designs next generation software for point-of-sale and Internet systems in the retail industry including entertainment, petroleum with convenience or food stores, and restaurants.

The Software Development Engineers I - Web Application Development will be primarily responsible for designing, developing and implementing software for new and existing programs for end user applications.

Candidates for these positions should possess a Bachelor's degree in a computer field and demonstrated knowledge of C++, VB, XML, ASP, XSL, HTML, Java Script and SQL. Object Oriented programming, technical documentation and software engineering methodologies, relational databases including SQL Server or Oracle and set-up and configuration of one of the following Microsoft operating systems: Windows OS, Windows NT, Windows 2000 or Windows XP. Reference Job Code #0030/38

The Software Development Engineer I - Point of Sale is primarily responsible for designing and implementing point-of-sale software for new and existing applications. Specific responsibilities include analyzing, programming, debugging and modifying computer programs.

Candidates for this position should possess a Bachelor's degree in Computer Science or a related field and demonstrated knowledge of C++, Object Oriented programming, relational databases, technical documentation, software engineering methodologies, TCP/IP networking, one of the following programming languages: Java, Clipper or Delphi, and set-up and configuration of one of the following operating systems: Windows NT, Windows 2000 or Windows XP. Reference Job Code #0031

The Software Development Engineer I - Windows will be primarily responsible for designing, developing and implementing software for new and existing programs.

Candidates for this position should possess a Bachelor's degree in a computer field and Demonstrated knowledge of C++, Object Oriented programming, Windows GUI programming including Win32API or MFC, set-up and configuration of one of the following Windows OS: Windows NT, Windows 2000 or Windows XP, technical documentation and software engineering methodologies and one of the following relational databases: Oracle, SQL Server or DB/2. Reference Job Code #0034. Apply with resume by mail to Vickie Olsen, Radiant Systems, Inc., 3925 Brookside Parkway, Alpharetta, Georgia 30022

Positions are available for Quality Engineer Analysts II and a Software Development Engineer II in Atlanta, Georgia with a technology solutions company. The company architects and designs test generation software for point-of-sale and Internet systems in the retail industry including entertainment, petroleum with convenience or food stores and restaurants.

The Quality Engineer Analysts II will be primarily responsible for designing, implementing, documenting, and maintaining software programs for computer-based systems. Also designs, develops, and implements tests and evaluates results for all product components.

Candidates for these positions should possess a Bachelor's degree in Computer Science, Engineering or a related field and two years' experience with regression integration, functional and stress testing, writing test plans, test scripts, and technical documentation, relational databases including SQL, Windows operating system and issue tracking software. The job also requires demonstrated knowledge of C programming and test lab set up including software installation, hardware configuration, and networking computers. Reference Job Code #005/37

The Software Development Engineer II - Decision Support Systems is primarily responsible for developing decision support software for major subsystems or sets of applications. Specific responsibilities include evaluating competitive forecasting products with an emphasis on accuracy and performance.

Candidates for this position should possess a Bachelor's degree in Computer Science or a related field and at least two years' experience with statistical methods such as autocorrelation, spectrum analysis or exponential smoothing, time series analysis, writing technical documentation data modeling; one of the following programming languages: C, C++, or Visual Basic; and demonstrated knowledge of SQL. Reference Job Code #0021. Apply by mail to Vickie Olsen, Radiant Systems, Inc., 3925 Brookside Parkway, Alpharetta Georgia 30022

PROGRAMMER ANALYSTS for Chicago IL office Design & Develop software applications using Oracle, Developer 2000, Designer 2000, Erwin, C++, Dalaware Housing, XML, Coolgen, ASP. Develop databases in oracle, SQL server on Windows & Unix. Bachelors req'd in Computers Engineering or related field of study +2 yrs of related exp. 40 hrs/wk. Must have legal authority to work permanently in the U.S. Send resume to HR Manager, Vigna Solutions, Inc., 4101 Chain Bridge Rd. Fairfax, VA 22030

Infinite Computing Systems a Cedar Rapids, Iowa company is seeking qualified computer professionals for our growing team. Current positions available must meet the following requirements. All positions require at least a Bachelors degree (foreign Bachelor degrees are acceptable). We may have additional positions available in addition to the ones listed. Multiple positions are likely available in some positions. Candidate's salary offered relative to experience and skills. Candidates must be willing to relocate and travel as needed.

- At least 1 yr exp as a computer professional incl. at least 1 yr exp in Expeditor, IDMS, DB2, Unix, Fortran, C++ and File Aid
- At least 2yrs exp as a computer professional, incl. at least 2 yrs exp in SAP, Java, HTML, and Weblogic
- At least 2yrs exp as a computer professional, incl. at least 2 yrs exp in Formware, ICR/OR recognition, Imaging, File Net, PC-Docs, Visual Basic, Java, SQL Server
- At least 2yrs exp. as a computer professional, incl. at least 2 yrs exp in MS Translation Server, VB Developer 2000, Magic, Oracle, and SQL Server
- At least 5 yrs exp as a computer professional, incl. of 1 yrs exp in Easyreave, QMF, MF-Cobol and MF-CICS
- At least 5 yrs exp as a computer professional using C, C++, VC++, Oracle, GUI and SQL Server

Please send resume and cover letter to: Rajendra Inani, President, Infinite Computing Systems, Inc., 230 2nd Street Ste 214, Cedar Rapids, IA 52401

Programmer/Analyst: Analyze, design, develop, test, implement and maintain customized software applications in a client/server or mainframe environment. Will also provide in-depth trouble shooting and problem solving as well as analysis, design, development and implementation assistance to AS/400 programmers, system administrators, operators and end users. Must have Bachelors or equivalent in CS/MIS/Engineering/Math or related. Must have 2 yrs exp. in job offered or 2 yrs exp in software development. Such experience must include AS400 and related tools. Must be willing to be assigned to unanticipated client sites throughout the United States. Salary $75,000/yr. Hrs 8:00am-5:00pm, 40/wk. Please send 2 copies of resume to: Case #200201344, Labor Exchange Office, 19 Stanford St., 1st Fl., Boston, MA 02114

SENIOR PROGRAMMER/ANALYST to analyze, design, develop, configure and customize computer software for various business applications using Siebel, SQL Server, Siebel Scripts, Siebel VB, Siebel Sales Enterprise and EIM on Windows platform. Require: Bachelor's degree (or equivalent) in Computer Science/Engineering, Business Administration, or a closely related field with two years of experience in the job offered. Each three years of progressively responsible work experience in the field will be considered equivalent to one year of college education. Competitive salary offered. Apply by resume to: Ken Boatman, RMIC, 190 Oak Plaza Blvd., Winston-Salem, NC 27105. Attn: Job SV

NETWORK ENGINEER to design, configure, test and maintain local and wide area networks under Windows NT/2000 and Linux operating systems. Plan, install and support servers, routers, switches, data and voice communication lines, network operating systems and other network related technology, including Cisco routers/switches, TCP/IP setup and DNS configuration. Maintain routers and switches, optimize traffic patterns and use traffic filtering to maximize bandwidth. Monitor systems performance and perform capacity planning. Test, research and recommend products. Support and monitor online transaction systems. Require: B.S. degree in Computer Science/Engineering or a closely related field with two years of experience in the job offered. A M.S. degree with a demonstrated ability to perform the stated duties gained through academic coursework/previous work experience will be accepted in lieu of the B.S. degree and two years of experience. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Send resume to: Renga Nathan, Brixium Inc., 1900 Emery St., Suite 200, Atlanta, GA 30318. Attn: Job MV

Programmer Analyst, Brutsaert, ME, analyze, design, write, implement, customize BaaN business applications, resolve problems and work with BaaN support on patch resolution, develop program specification packages, business requirements and test scripts, conduct design and programming in BaaN tools and seagate information; develop E-Commerce BaaN front office; re-engineer business processes, conduct user training and technical support; prepare user and technical documents; use Windows NT BaaN8 4C3, BaaN tools, OEM, Report Writer tool, BaaN distribution and manufacturing modules (sales order processing, order acknowledgement, pick/pack operations, shipping, inventory and engineering data management), and MRP/MPS, must have experience with barcoding application to BaaN, integration of third party packages to BaaN and conversion from legacy-BaaN life cycle implementation with at least one year post implementation support. And BaaN certification in logistics and CPIM and four years experience in BaaN distribution and manufacturing modules. Bach. Deg in Indust or Elect Engineering, plus 5 yrs exp. Mon-Fri 9am - 2pm 40hrs wk, $105,500 per yr send res to Bureau of Labor Standards, 45 State House Station, Augusta, Maine 04333-0045 ref to Job Order #33868 be Programmer Analyst.

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Positions are available for a Senior Business Analysts, Consulting - Grad in Atlanta, Georgia with a technology solutions company. The company architects and designs next generation software for point-of-sale and Internet systems in the retail industry including entertainment; petroleum with convenience or food stores, and restaurants.

The Senior Business Analyst Consulting - Grad is primarily responsible for providing consulting services to define best operational practices for the implementation of complex software applications for Radiant clients.

Candidates for these positions should possess a Master's degree in Business Administration or a computer field one year's experience in retail technology consulting, or business operations including finance, accounting, or general management; team leadership or project management; and one of the following technology implementation, application programming, systems analysis and management, or business process analysis and re-engineering. Reference Job Code #020/33

Apply with resume by mail to Vickie Olsen, Radiant Systems, Inc., 3925 Brookside Parkway, Alpharetta, Georgia 30022

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Software co. in Bedford, MA seeks QA Systems Analyst for quality assurance testing and engineering on ERP software including develop/implement automated and manual test cases; identify/resolve bugs; define Test Plans and Objectives for integration software package and participate as QA representative on teams for future products. Must have: Bach. in Comp Sci or equiv.; 2 yrs exp. in software development or testing; knowledge of ERP software systems; integration with financial packages such as Oracle Financials, Peoplesoft or SAP. Salary $84,000/yr. Submit 2 resumes to Case #200201351, Labor Exchange Office, 19 Stanford Street, 1st fl., Boston, MA 02114.

An Atlanta-based IT firm is seeking qualified computer professionals like Programmer Analysts, Systems Analysts, Database Administrators, for assignments to clients sites in the U.S. Must have bachelor's degrees in Comp. Sci. or Math or Engineering, with extensive (at least 2 yrs) exp. in Oracle, Powerbuilder, Java, Perl, C/C++, and .NET. Must be willing to work in different clients sites throughout the U.S. Send resumes with salary requirements to: The Recruitment Manager, SourceTec, 292 S. Main Street, Suite 500, Alpharetta, GA 30004

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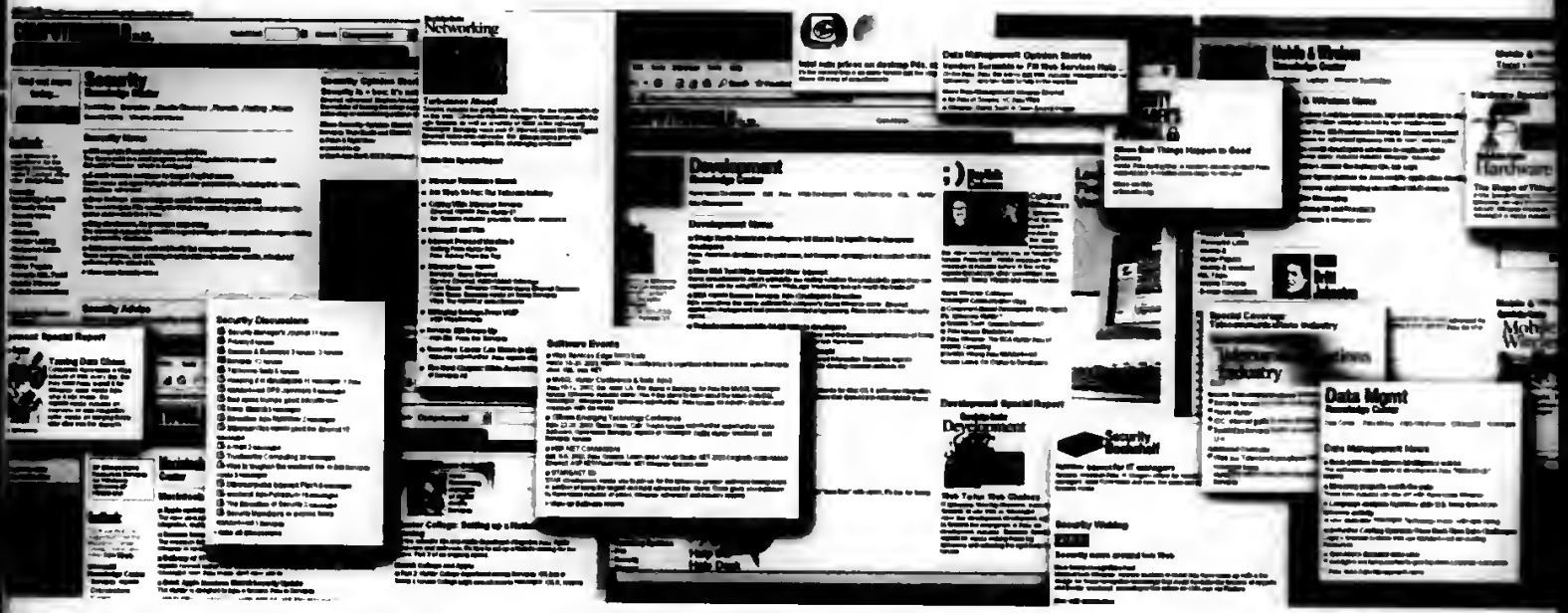

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Maryfran Johnson, editor in chief
(508) 820-8179

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Craig Stedman, assistant News editor ..... (508) 820-8120
Julia King, Management editor ..... (610) 532-7599
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REPORTERS

Bob Brewin, mobile computing/wireless; Intel PCs and servers; health care ..... (505) 425-3551
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Marc L. Songini, ERP; supply chain; CRM; databases; data warehousing; EAI; CA ..... (508) 820-8182
Patrick Thibodeau, enterprise systems; outsourcing and immigration issues; corporate antitrust issues ..... (202) 333 2446
Dan Verton, federal/state government; legislation; critical-infrastructure security; travel ..... (703) 321-2277
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OPINIONS

Patricia Keefe, editor at large ..... (508) 820-8183
Mark Hall, opinions editor ..... (503) 391 1158
Frank Hayes, senior news columnist ..... (503) 252-0100

FEATURES EDITORS

Ellen Feaming, special projects editor ..... (508) 820-8204
Robert L. Mitchell, technology evaluations editor ..... (508) 820-8177
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Tom Monahan, online director ..... (508) 820-8218
Sharon Machlis, managing editor/online ..... (508) 820-8231
Ken Mingis, online news editor ..... (508) 820-8545
Marian Prokop, online editor at large ..... (508) 620-7717
David Ramel, e-mail newsletter/online editor at large ..... (508) 820-8269
Brian Sullivan, online editor at large ..... (508) 620-7780
John R. Brillon, associate art director ..... (508) 820-8216
David Waugh, associate art director ..... (508) 820-8142
Keeley Guillerma, marketing specialist
Peter Smith, Web development manager
Kevin Garish, Mark Savery, Web developers
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Mari Keefe, research manager
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COPY DESK

Jamie Eckle, managing editor/production ..... (508) 820-8202
Michele Lee DeFilippo, assistant managing editor/production ..... (508) 820-8126
Bob Rawson, Monica Sambataro, senior copy editors
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Stephanie Faucher, design director ..... (508) 820-8235
April O'Connor, associate art director
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ADMINISTRATIVE SUPPORT

Linda Gargano, office manager ..... (508) 820-8176
Cheryl Dudek, administrative assistant ..... (508) 820- 8178

CONTRIBUTING COLUMNISTS

John Berry, David Foote, Fiona Fox, Michael Gartenberg, Dan Gillmor, Thornton A. May, David Moschella, Bart Perkins, Nicholas Petreley

CONTRIBUTING WRITERS

Mary Brandel, Amy Helen Johnson, Russell Kay, Sami Lais, Kathleen Melymuka, Deborah Radcliff

GENERAL INFORMATION

TELEPHONE/FAX

Main phone number .... (508) 879-0700
All editors unless otherwise noted below
Main fax number ..... (508) 875-8931
24-hour news tip line... (508) 820-7716

E-MAIL

Our Web address is www.computerworld.com.
Staff members' e-mail follows this form: firstname_lastname@computerworld.com.
For IDG News Service correspondents: firstname_lastname@idg.com.

LETTERS TO THE EDITOR

Letters to the editor are welcome and should be sent to: letters@computerworld.com. Include your address and telephone number.

MAIL ADDRESS

PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701

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PeopleSoft

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The idea of streamlining the software upgrade process is also of interest to George Muller, CIO at Imperial Sugar Co. in Sugar Land, Texas. The sugar maker runs a mix of PeopleSoft 7 and 8 ERP applications, and Muller said any technology that can reduce costs and time-consuming procedures for his IT staff "definitely gets me excited."

But Joshua Greenbaum, an analyst at Enterprise Applications Consulting in Daly City, Calif., said PeopleSoft needs to prove that it can back up its lofty rhetoric.

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Rick Bergquist, PeopleSoft's chief technology officer, said the company plans to build packaged connectors into its applications so users can more easily connect them to software from rival vendors like SAP AG and Oracle Corp. For example, he said, the next release of PeopleSoft's supplier relationship management module, due later this year, will support out-of-the-box integration with SAP applications.

Bergquist called PeopleSoft's plan "the beginning of the end of middleware." Another PeopleSoft executive said the built-in connectors will require less work on the part of IT managers than the AppConnect integration tools that the company announced last August.

But AppConnect will continue to play a major role in enabling the promised integration with rival applications, according to PeopleSoft. And Bergquist said specialized connectors may be needed to help users integrate PeopleSoft applications with homegrown or heavily customized systems.

PeopleSoft is also working to embed diagnostic tools in its applications to help IT managers track software patches and automatically download newly issued ones. In addition, Conway claimed that users will eventually be able to upgrade their applications with zero downtime.

PeopleSoft Maps Out Linux Strategy

PeopleSoft also announced at last week's conference that it plans to make all 170 of its applications available on Red Hat Inc.'s version of Linux, starting in the fourth quarter.

David Sayed, technology product marketing manager at PeopleSoft, said the move was prompted by an increased interest among IT managers in using Linux beyond basic file and Web servers. "Now, customers are telling us they want to run enterprise applications [on Linux-based systems]," he said.

PeopleSoft anointed IBM's Intel-based servers, DB2 database and WebSphere application server software as its primary development platforms for the open-source operating system. But the software vendor said it will also support its applications on other servers that run Red Hat Advanced Server.

Like other application vendors, PeopleSoft is recognizing "the competitive aspect of having a Linux solution," said Stacey Quandt, an analyst at Forrester Research Inc. in Cambridge, Mass. "There's obvious demand in the market."

George Muller, CIO at Imperial Sugar, said Linux support may be of some interest to him down the line. But the sugar maker currently runs its systems almost exclusively on Windows, and Muller said he plans to get the most out of his investments in Microsoft Corp.'s technology for the next several years.

A similar situation prevails at Vail Resorts Management. Vicki Silvera, the company's director of information systems, said Linux is starting to catch her attention.

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MORE FROM LAS VEGAS

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N/MCI

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N/MCI is a $6.9 billion IT outsourcing contract, often referred to as seat management, that will give the Navy and Marine Corps secure, universal access to integrated voice, video and data communications. Plano, Texas-based EDS won the contract in October 2000. However, technical difficulties, deployment delays and user complaints have hampered the program since its inception.

During the first quarter, EDS made what Swan called "reasonable progress" in the number of N/MCI seat orders received, but he said the company fell behind in the number of seats actually "cut over" to N/MCI. Swan added that EDS has "good visibility" into second-quarter orders for seats but that "we need to accelerate the cut-over seats to a rate of approximately 900 a day and hold this level throughout the year."

More important is the impact that the N/MCI loss has had on free cash flow. EDS now expects to have $1.9 billion in free cash flow, compared with its prior estimate of $2.1 billion, said Swan.

While several risks to the N/MCI contract remain — such as more deployment delays, further declines in average seat price and poteotial delays in milestone testing — "we believe they are manageable," said Swan.

Swan assured financial analysts that the company is taking steps to improve the operating controls of the N/MCI account. So far, EDS has made improvements to the cost estimation process, assigned additional financial personnel to the contract and made staff changes at the program management office.

EDS has also conducted a detailed review of at least a dozen so-called problem contracts, said Swan. "While we continue to pursue megadeals as a key element of our strategy, we are being more selective in the deals we are looking at," he noted.

EDS CEO Michael Jordan said that during the past several months, EDS has backed away from contracts that would put the company in a position of too much negative cash flow. "This is, in fact, a cash-generating business," said Jordan. "We have to re-establish the company's credibility with the financial community." Details on EDS's strategic transformatioo plan will be released next month.

When a financial analyst asked if there was a chance that the N/MCI contract wouldn't be part of EDS's portfolio in the near future, Jordan responded, "I would-o't think so."

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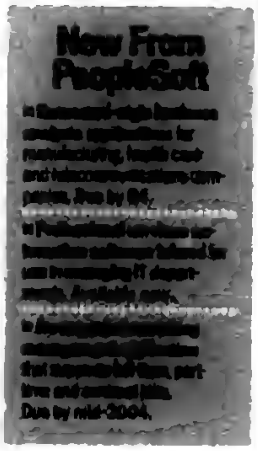

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FRANK HAYES ■ FRANKLY SPEAKING

Boom & Bust Blues

THERE'S SUPPOSED TO BE PLENTY of good news to go around in the "2003 IT Workforce Survey" released last week by the Information Technology Association of America. If you're a CIO or corporate IT manager, the good news is that IT labor costs are stabilizing and IT shops are mostly able to hire the people they need. For IT workers in the trenches, the good news is that layoffs are slowing, actual pay cuts are largely a thing of the past, and only 4% of corporate IT departments are considering moving jobs offshore in the next year.

Yeah — that's what qualifies as good news these days.

Trouble is, the survey doeso't show what lies just beneath that feehle good news: Corporate IT morale is in the toilet. And the No. 1 reason is the one thing you can't do much about: the long, long hours.

You can't do much about the hours your people work because the work has to get done and there's no budget for hiring more people to do it. So more and more of our best people are coming to the conclusion that there's a better life to be had than grinding away in an IT shop.

And who will you lose at the first opportunity? Your smartest, sharpest people, that's who. Your IT shop leaders. The ones who best understand the connectioo between IT and business. The ones you'll need the most, once you get the green light to start building new projects again.

They're the ones who don't have to stay — who can take their corporate IT experience and parlay it into a new career, whether that means conventional IT consulting or a new specialist gig combining law and IT, medicine and IT or some other profession and IT.

And why *should* they stay? They're smart enough to understand that this crunch isn't a one-time thing. We've been through it before. First there's an IT skills shortage: IT shops go crazy looking for ways to fill critical jobs, and IT becomes the hot place to work. Then a few years later the business tightens up, layoffs mount, salaries fall, hours get long and college students switch their majors to anything but computer science.

Which, a few years later, results in another shortage — and the cycle begins again. No wonder your best people want to leave. They love their work, hut what sane person would want to huild a career oo that sort of manic-depressive boom-and-bust cycle?

Can you keep them? Maybe. Your best shot to do that may be to get your IT shop out of the boom-and-hust busioess. You can't stop economic cycles or change the laws of supply and demand. But you can change the way you organize your shop.

You've heard about cross-functional teams for years. Build a few. Bulldoze some of the walls between different IT functions. You've got programmers and database analysts and network administrators and help desk specialists. Start cross-training. Your programmers don't have to become database experts or network gurus, but the more they know about those other jobs, the better they can create systems that save grief for the whole business.

Afraid they'll take the training and run off to a better joh? They won't if you invest in educating them for what *your* organizatioo needs. Forget generic IT training — put them to work studying your company's busioess processes, learning techniques to pry requiremeots out of your users and understanding the realities of your corporate culture.

That will make them much more valuahle to you — but oot especially more attractive to another employer who's just looking for someooe fresh out of XML class.

You'll get better, smarter work. You'll get more flexibility and efficiency in your IT shop, and greater focus on real husiness value.

You may eveo find that your cross-functional IT people doo't have to put in such long hours to get the work done.

And for your employees, that would be *really* good news. ◗

Networked Storage Offers Cure for Backup Ills

Sony StorStation™ family of network-attached storage solutions brings backup efficiency and consolidation to organizations of any size.

Many organizations are finding that tape backup systems installed years ago can't keep up with the new business requirements of today. The problems range from having older tape formats with insufficient capacity to dealing with collections of individual tape drives that require significant IT attention to ensure that backups run on schedule. If your backup tasks are growing out of control, there's a good chance that Sony's family of StorStation networked backup solutions can bring consolidation and efficiency to your backup processes.

For some organizations, increasing backup operational efficiency can be as simple as upgrading to higher capacity tape drives, such as Sony's Advanced Intelligent Tape™ (AIT) family of reliable data protection solutions. For others, it may mean adding automation, such as tape libraries that automatically manage media cassettes and back up on a scheduled basis. But for more and more organizations, increased efficiency is better achieved by adding dedicated network storage solutions to their networked environment in order to consolidate backup tasks, ensure greater efficiency, and reduce backup management and maintenance requirements.

Network-attached storage (NAS) devices, such as those in the Sony StorStation product family, enable organizations to increase efficiency by consolidating multiple backup devices or disk storage devices onto existing Ethernet networks. NAS devices act as centralized backup coordinators that can be configured in a number of ways to suit many business requirements. In the simplest configuration, a NAS server provides shared files or shared network storage for multiple servers. With the proper integrated software, NAS file servers can act as networked caching devices, providing speedy access to frequently used data. And for organizations with a range of network backup or archival requirements, a NAS backup server can route data to an attached tape library, enabling organizations to keep up with increasing backup demands by merely adding additional or higher capacity tape drives. Combining a NAS device with one or more tape libraries brings increased data protection and offers a cost-effective solution for long-term near-line or offline storage.

In addition to increased efficiency and consolidation, automated networked backup solutions can ensure backups are performed on schedule, with limited or no human intervention. The combination of a NAS server and a tape library is a particularly good solution for scenarios such as:

- Centralized backup for remote locations or branch offices that lack on-site IT support,
- Businesses that have outgrown their existing tape capacities,
- Cost-effective disaster recovery for businesses that have many store locations, such as retailers, and
- Departments with multiple servers and growing data requirements.

In the past, it has been cost-prohibitive or too complex for many organizations to deploy networked devices to address such scenarios, but Sony's family of networked backup solutions changes the cost equation. Sony offers two types of NAS solutions: Sony StorStation™ Backup Servers and Sony StorStation™ NAS File Servers.

Sony's StorStation™ Backup Servers combine Sony's high-performance Advanced Intelligent Tape (AIT) library with a NAS file server and a leading pre-integrated backup management software solution. The "NAS head" provides network connectivity and backup management, while the StorStation™ AIT library provides the backup capacity, automation and media handling. For environments with growing data protection and archival requirements across multiple application, database or production systems, the StorStation™ Backup Server solution provides a single point for backup consolidation. Moving from a server-attached backup strategy to a networked solution brings cost and efficiency benefits by eliminating the duplicate resources, efforts and equipment required to back up individual servers separately. As the number of servers or the amount of data generated grows, the cost-benefits of a networked backup approach increase.

The Sony StorStation™ Backup Server, when used with a Sony tape library, is ideal not only for consolidating backups on-site, but also as a component of an overall backup strategy for companies needing to back up or archive data from satellite or branch offices. The StorStation™ Backup Server, when used with a Sony tape library, delivers the capability needed to achieve an unattended backup of several days or even several weeks, depending on the amount of data to be protected. In addition, it can be managed remotely simply by connecting it to the headquarters office's wide-area network.

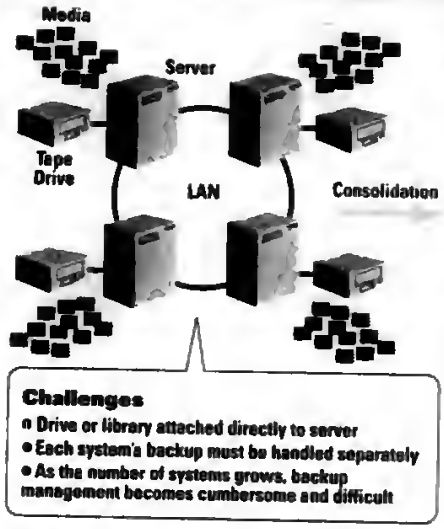
Sony's StorStation™ NAS File Servers provide a low-cost solution for data storage consolidation, file serving and file sharing capabilities for small and midsize businesses and enterprise departments. Sony StorStation™ NAS servers are an ideal complement to Sony AIT tape libraries. For organizations with a range of file sharing or network storage requirements, Sony provides NAS server configurations that provide 330 GB to 720 GB of networked storage.

For ease of use and flexible access, Sony file servers feature browser-based management and file sharing support for Windows®, Unix®, Linux®, Novell® and Macintosh® operating systems. Data protection is achieved by RAID-5, RAID-1 and RAID-0 options. For an extra level of data protection of the consolidated data, Sony AIT libraries can be combined with the StorStation file servers via a SCSI port. Connectivity into industry-standard networks is provided by Gigabit Ethernet or dual 10/100 Ethernet ports.

Sony's StorStation™ NAS backup servers and file servers integrate the best of high-end enterprise storage functionality into solutions that are affordable, easy to use and easy to manage. Whether for remote office, workgroup or data center deployments, all StorStation™ NAS devices are compact, 1U high, rack-mountable units designed to fit neatly into areas where space is limited.

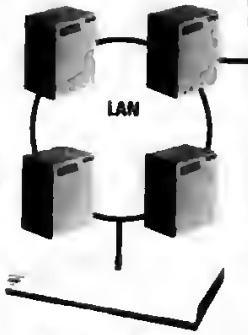
If your business is struggling to manage multiple tape drives spread across your network, or if you need to consolidate your data and make it easily accessible to your networked clients, the time is right for Sony's Network Solutions—the smart investment.

Consolidating and Simplifying Backup and Storage



Challenges

- n Drive or library attached directly to server
- Each system's backup must be handled separately
- As the number of systems grows, backup management becomes cumbersome and difficult



Backup Consolidation

Backup appliance sits on the network

Benefits:

- Automated and streamlined backup management
- More manageable growth and scalability
- Turnkey solution with pre-packaged backup management software

Network Storage Consolidation Benefits:

- File sharing
- Storage consolidation
- Centralized management and growth

If your business is struggling to manage multiple tape drives spread across your network, or if you need to consolidate your data and make it easily accessible to your networked clients, the time is right for Sony's Network Solutions—the smart investment.

Learn More About

Sony StorStation Solutions

Download the free white paper, "Networked Backup: The Path to Greater Efficiency and Consolidation"

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